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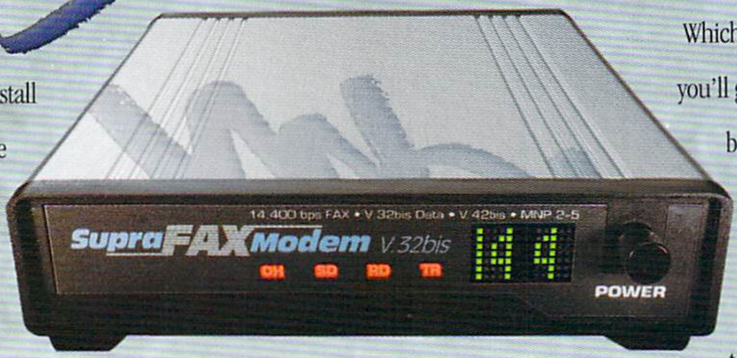
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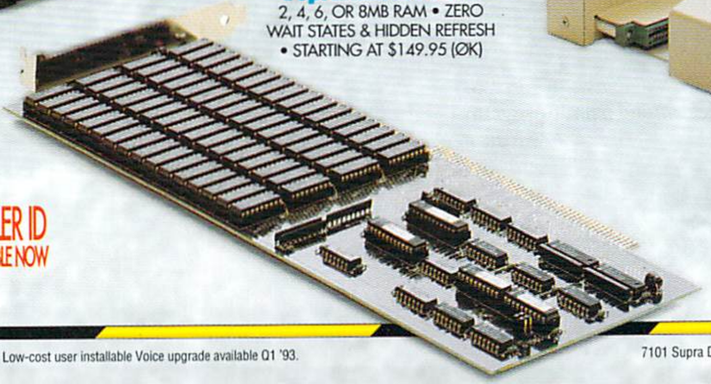
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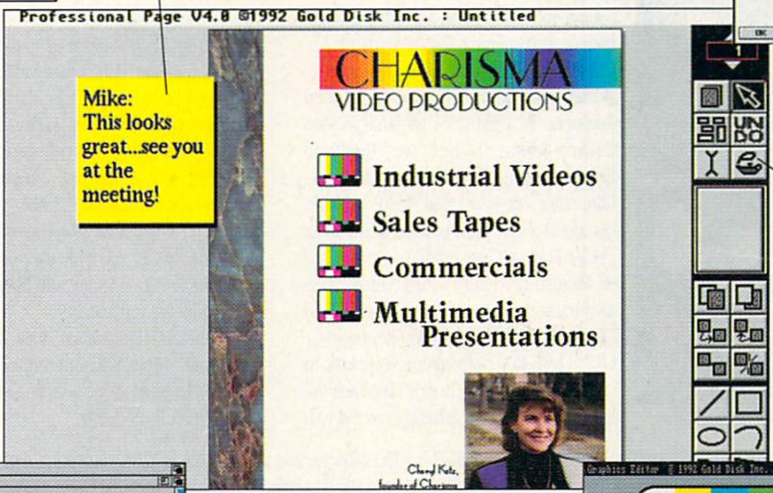
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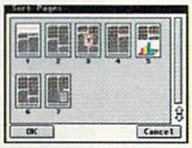
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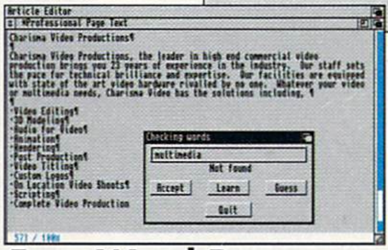
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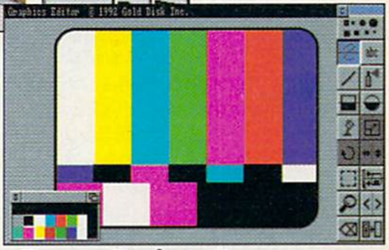


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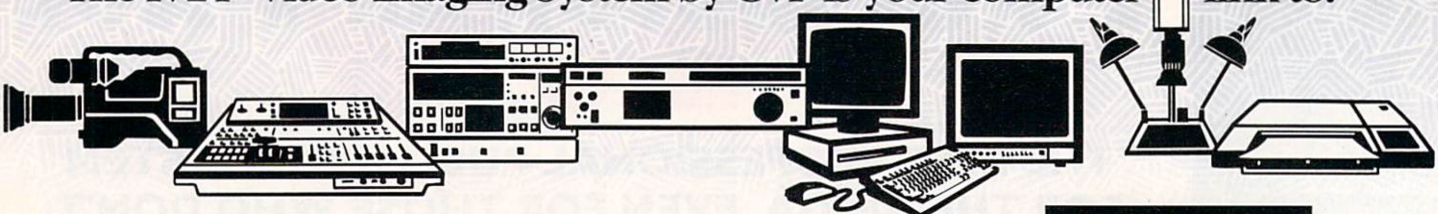
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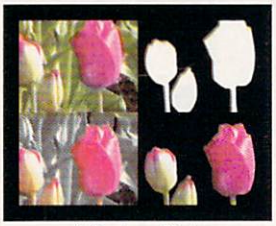
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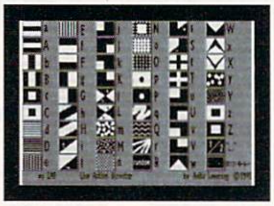
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Karim Miteff Co., Producer, Nickelodeon Arcade, Bethea/Miteff Productions, Orlando, FL

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Graphic Courtesy of Nickelodeon

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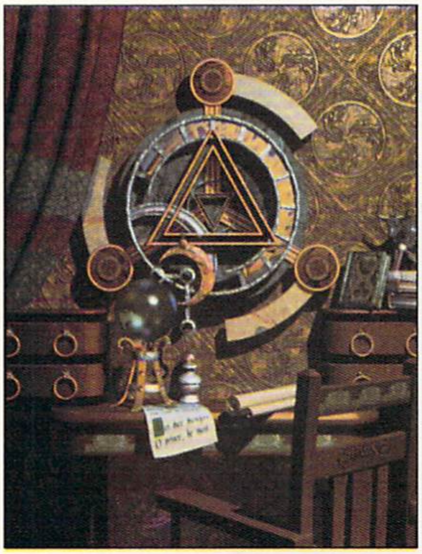
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Powerful display boards for 24-bit graphics.

ABOUT THE COVER
For more details about the full-color Amiga-generated image on this month's cover, see the box on **p. 120**.

COVER SCREEN IMAGE BY MARK MILLER
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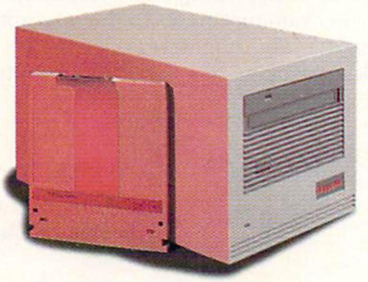
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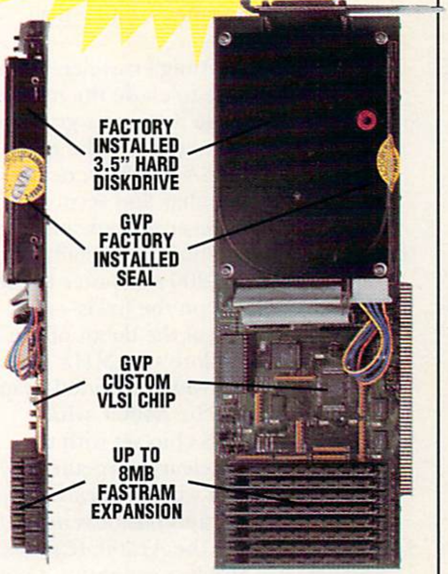
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EDITOR'S DRAWER

Just when you thought it was safe to settle back with your familiar Amiga computer, Commodore forces you to make some tough choices.

Commodore Users at the Crossroads

You may have survived the multimedia blitz. Or artfully dodged the pitch for productivity. Or escaped unimpaired the entertainment invasion.

But you better brace yourself for the next barrage.

We are in the throes of a revolutionary computer change, featuring a new generation of Commodore machines and accompanied by new graphics standards with more colors and higher resolution, faster processing speeds, new hardware features, and a new operating system.

Pity the poor Amiga traveler. He or she won't be able to elude the invasion. The only recourse is to get a grip and decide which road to take: the new expressway of AGA graphics, or the old streets, more familiar and secure.

Commodore recently took advantage of the Comdex Show to formally introduce the new A1200 computer in the US. This follows on the heels—two months earlier—of the debut of the A4000, Commodore's 25 MHz '040-based computer with expanded graphics capabilities. The A4000, which replaced the ECS chip set with the AGA chip set, is clearly targeting the high-end market with applications for the professional and business markets. Its little brother, the A1200, features a smaller case and less expansion potential, but includes the same audio and graphics capabilities, as well as the new operating system.

Commodore emphasized that the A1200 does not supplant the A600 or A2000 computers, whose fates depend on user demand. With its features and price point, the A1200 is well-suited for the home user or where a back-up computer system or portability, such as in kiosk displays, is warranted.

Commodore, with its engineers as busy as elves on Christmas Eve, is to be commended for meeting the needs of today's creative users—from the amateur artist to the video professional. CBM's announcements—designed to counter recent moves in other markets that featured the relaunch of two competitive computers (PC and Mac Classic)—clearly strengthen the Amiga's position as the multimedia micro best suited for video, animation, presentation, and graphics. Now, with the release of the low-cost A1200, Commodore is also addressing the needs of non-video users, regardless of application—business, productivity, entertainment, education, whatever.

Several products—both hardware and software—for the new machines are already on the scene, and we know that more are on the way. The Commodore support market is gearing up to develop and modify its existing products to make sure they're compatible with the AGA standard and the new operating system. *AmigaWorld* will report on these new developments as they become available.

It's an exciting time. Commodore's new machines have been well-received—by users, dealers and developers. We anticipate that this will translate into exciting new products and applications for these machines…and can't wait to see what else Commodore has in store.

What all this means for you, Amiga user, is that you have some tough choices to make.

For some of us the choice is obvious: "I want to ride the cresting waves, so AGA is for me." Others may be more reticent, preferring to follow in the wake and wait for sales and support to be established. But what about the rest? Will we hit the waves or sit on shore?

The expansion features of the Amiga only make the decision process more difficult. With Commodore's new A570, for instance, Amiga 500 owners can add a CD-ROM drive, which opens up a whole new world of CD storage and capability, CDTV titles, additional RAM, and expandability options. Video artists can use existing Amigas, all of which, to some extent, can be used for video work. And, if you've already added an accelerator to your Amiga, you may not need the speed increase of the new machines. For some, the memory of a recent purchase—a video card or another hard drive, for example—may have diminished your enthusiasm, as well as your pocketbook, for another high-tech computer.

But if, on the other hand, you want the latest in graphics capabilities, then the choice is clear. You'll have to join the AGA generation. Until someone develops a practical alternative, there seems to be no way to upgrade existing Amigas to the new graphics standards.

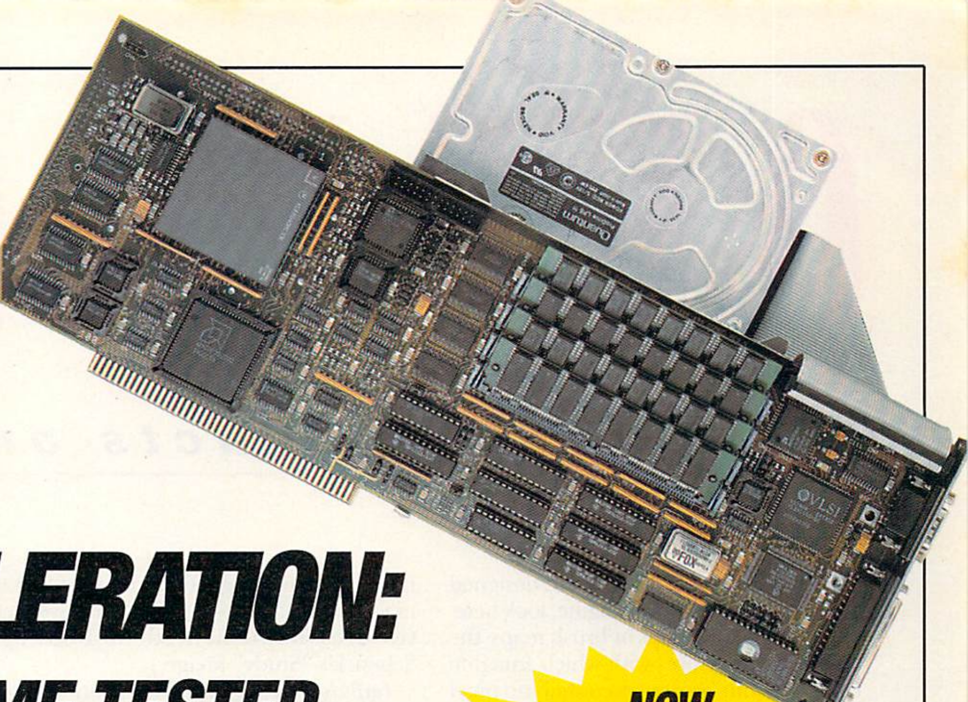
So there's the choice: Keep your present system and purchase add-on products that increase its power and productivity or buy one of the new machines. Some Amiga owners, like some car owners, must have the newest model each year, while others are content to keep the older buggy as long as it runs well. It depends on your needs and applications.

But don't wait too long to decide. Commodore has stated that it "plans to move quickly in its development and release of new Amiga models and its further enhancements to the operating system." This might be your time to take advantage of a great opportunity.

Dennis Brisson

Dennis Brisson
Editor-in-Chief

FOR THE AMIGA® 2000 SERIES



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OVERSCAN

News, New Products and Networks

Just Imagine

If you're looking for software designed to work with Impulse's Imagine, look here.

Unlike texture maps or brush maps, the algorithmic textures with which Imagine lets you define attributes contain no pixel artifacts. ***Apex Software*** can more than quintuple the number of algorithmic textures that come standard with Imagine. **Essence** ($79.95; RS# 126) gives you 65 new possibilities, ranging from the simple Hex (colored hexagonal tiles) to the complex Fractal Noise (a turbulent, detail-rich natural-looking coloring for such objects as clouds, fire, planets, and so on). The algorithms are fully compatible with the floating-point versions of Imagine 2.0, 1.1, and even its predecessor Turbo Silver; sufficient demand will result in an integer version designed to run on 68000 machines. (Turn to p. 30 to see Essence textures implemented in Bradley Schenck's "Study" image.)

Impulse itself is distributing an Italian program, **Morphus** ($119.95), "a kind of solid modeler." Morphus accepts a TDDD object or group previously created with other modelers, and then deforms the loaded surface and saves one or more TDDD files with the same configurations as the original object. The structure remains unaltered except for 3-D point coordinates.

Because Morphus computes matrices, it involves many calculations and therefore provides increased performance on accelerated Amigas. The amount of memory it requires depends on the number of points and edges you specify; by default the program runs with 1MB. (RS# 127.)



OVERHEARD

The sixth annual Bit.Movie contest will run April 9–12 in Riccione, Italy. Categories include still images, animations, and real-time music. All entries must be created on a personal computer, and must be postmarked by March 10, 1993. For more information, write to Bit.Movie '93, c/o Carlo Mainardi, via Bologna 13, 47036 Riccione, Italy. Or, fax him at 39-541-646635.

CyberArts Reveals Amiga is Positioned for Multimedia

PASADENA, CALIFORNIA—For those concerned with the evolving worlds of interactive multimedia and virtual reality (VR), one of the most significant conferences each year is CyberArts International. The third annual show was held October 29–November 1 in Pasadena. Founded by the publishers of *Keyboard Magazine*, the show feels like a cross between a futuristic Renaissance Faire and an intergalactic meeting of artists, scientists, developers, and business scouts.

The Exhibit Hall is a three-ring circus of exotic futurists decked out in VR helmets and bodysuits inviting visitors to experience new realms of multisensory imagination. The tutorial sessions are in-depth demonstrations of the latest hardware and software tools, with practical business discussions on multimedia VR applications for interactive games, education, film production, theme parks, architecture, and industrial design. This year the Grand Hall sessions examined startling new multimedia applications and challenged attendees to consider the social impact of their creations. The very last event of the conference is the Artists' Summit, a dedicated forum for the exchange of ideas and contacts for those seeking technical solutions, sources of funding, and collaborative partners.

Amiga users may be proud to know that the hands-down hit was Virtuality. Driven by a well-hidden A3000, it is the first fairway-style VR game being installed in malls around the country. Busy conference attendees stood in line 40 minutes to get their turn on the Virtuality cybernaut platform.

The Amiga Angle

Animator (and *AmigaWorld* contributor) Steve Segal was spotted looking over Autodesk's highly-publicized new $3000 3-D Studio package for the PC. As an Imagine and LightWave user, Steve was surprised at the relative clumsiness of 3-D Studio's interface and navigating tools. "It's not close to what we already have in LightWave," he said.

There was an "Amigamaniacs" tutorial, which surveyed the advantages of the Amiga for multimedia developers. John Donovan, Amiga editor for *Verbum*, suggests that new platform-emulation utilities for the Amiga, the dedicated graphics and audio chips, and inherent architectural advantages for video handling combine to make the Amiga the power platform for the future of multimedia. Currently the majority of American developers use an expensive Silicon Graphics workstation or a Macintosh computer (which has only one CPU for handling all data, including graphics and audio.)

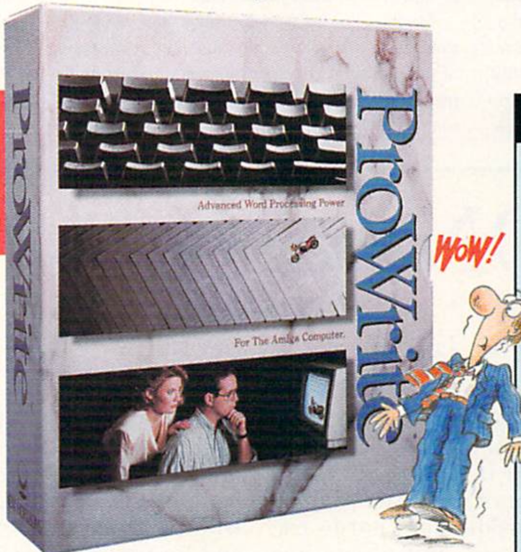
Donovan showed the A4000 and its exciting new object-oriented Workbench 3.0 with Advanced Graphics Architecture (AGA), shared palette capability, PostScript-print support, file-format converter, high-density drives, graphic windows of stored video images, and the "locale library" that supports 17 languages to help developers internationalize applications rapidly. He pointed out that the Amiga's cooperative (versus preemptive) multitasking allows multimedia developers to have MIDI programs running in the background, with ARexx tie-ins between image-processing programs such as ASDG's Art Department Pro and NewTek's Digi-Paint, so that, "a developer doesn't have to take time to develop macro language; they can set up looping programs to automatically process thousands of images between applications tied together in the integrated environment."

Cooperative Development

Steve Hicks of Laser Motion demonstrated platform emulation, using ReadySoft's AMax II+ to emulate the black-and-white Macintosh series. The Amiga's dedicated graphics chip gave an impressive power boost to such programs as Aldus ►

To locate the vendors of products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 114.

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- Insert IFF and HAM pictures in your documents.
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  - Multiple columns, with snaking or side-by-side text flow.
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- Thesaurus with 300,000 cross-references.
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- HotLinksTM support.
- Undo and Redo command.
- Mail merge.
- AREXX port.
- Macros, when used with AREXX.
- Name and search for pictures in a document.
- Speaking capability, to read back document contents.
- Separate odd and even page headers and footers.
- Paragraph sorting.
- Automatic page numbering, with five different page number styles.
- Insert current date and time, with five different date formats and two time formats.
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- Easy to use "3-D" user interface look.
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- Full support for Kickstart 2.0.
- Requires Kickstart 1.2 or later, one megabyte of memory, and two disk drives.

NEW HORIZONS

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Pagemaker. Many develpopers are looking forward to the ability to develop QuickTime movies with the Amiga, but Utilities Unlimited's Emplant board, which promises to emulate the color Mac IIci, is not yet available. This could be a breakthrough for developers, as most multimedia-development software and applications are now for Mac, even though the Amiga is inherently more flexible. PC emulators such as Commodore's Bridgeboard and Vortex's ATonce, allow Amiga's multitasking flexibility to toggle between PC and Amiga applications. Centaur's OpalVision, with its 24-bit color graphics tools, ASDG's Morph Plus, and NewTek's LightWave were among other Amiga products demonstrated.

Meanwhile, back in the halls, some techno-trekkies exchanged exotic ideas about the future of direct neural implants, but the greatest excitement was generated by the affordability of multimedia tools, which Stewart Brad (developer of The *Whole Earth Catalog* and the Well computer network) called "the new peasant technology, within reach of every home." He predicts this technology will progressively replace passive linear entertainment with smart TV systems that are linked to computer exchanges, through which many people can simultaneously play in the same interactive movie—and then create their own. Stay tuned, cybernauts.

—Patric Hedlund



ON-LINE SCAN

By Tim Walsh

Long-overdue praise and recognition is in order for those who enjoy serving as sysop (system operator) for a public BBS. Amiga users have fewer sources of system-specific information than, say, IBM-PC owners, so bulletin-board systems are invaluable to them. As timely sources, they are important tools not only for individuals, but for users' groups, manufacturers, and anyone needing to collect or distribute files and garner feedback. But, while BBS sysops can rest assured that they are providing an important service, I feel obligated to forewarn, though not discourage, any considering this demanding job. (And long-term stints as a sysop for various BBSs make me somewhat of an authority.)

Self Motivation

The task reminds me of my childhood career as a sidewalk snow shoveller. What that lowly position lacked in prestige, it also lacked in compensation. And just when I'd decided that the job couldn't get worse, neighborhood kids discovered great sport in pelting me with snowballs. Nonetheless, small signs of appreciation from anyone who didn't slip and fall as a result of my efforts made it gratifying work.

Maintaining a public BBS is no sweat physically, but otherwise it's like having Bruegel the Elder paint endless landscapes of despair deep in one's psyche. In place of back pain, you get unpredictable hardware, software, and phone-line failures. Instead of low wages, there are (usually) no wages. And, lacking snowballs, errant juveniles hurl grammatically incorrect insults at your message area.

Finally, increasing success demands an ever greater price: The time spent maintaining the BBS grows in proportion to numbers of callers, inquiries, and files.

If operating a BBS required only a dedication to appreciative callers, a dog could do it. But to be a good sysop, you need unselfish willingness to sacrifice your free time even to the unappreciative. Even the busiest sysops learn that it pays to answer all posted questions within a day or two, lest the BBS users become restless. If there's a plus side to being a sysop, a less-than-prompt response to inquiries usually creates little more than mutual bitter feelings, and all but the rudest callers are understanding.

But the prerequisites don't end with time and patience; setting up a BBS demands at least one reliable, hard-drive-equipped Amiga, at least one modem with a dedicated phone line, and, of course, software. Software is where the commercial networks offer relief. There's no need for a sysop to plunk down big bucks for a commercial BBS program; shareware and freeware programs are amply supplied on the nets.

Software Assistance

Because most of these programs are available on all the networks, I'll list the more popular ones available on BIX, CompuServe, GEnie, and Portal:

BaudBandit BBS: The most recent version, 5.7, was uploaded to several major nets in mid-November. This ARexx-based version seemingly offers whatever option your BBS needs. There are 99 file libraries and fully threaded message conferences. Numbers of users, files, and messages are determined by storage space.

Elite BBS 31: A popular multitasking BBS, with few bells and whistles, for getting up and running in a hurry.

Falcon BBS: Available on most nets in two parts that appear as FALCON1.LZH and FALCON2.LZH, this is a much sought-after BBS. Equipped with Fidonet support, Falcon offers message editors, programmable menus, and up to 100 message bases and file areas.

Proteus BBS Engine Package: Another ARexx-based programming package, Proteus comes with the BBS server and system scripts. A working knowledge of ARexx commands and scripts is mandatory, as ARexx is used to program all user interaction.

MicroHost 1.3: Roughly 27K in size, MicroHost is probably the smallest Amiga BBS you will find. Sure, it lacks most features of larger BBS programs, but it makes for a great way to quickly familiarize yourself with bulletin boards.

Finally, don't overlook the vast array of BBS utilities, maintenance files, and BBS-specific games in the Amiga areas. An essential for all Amiga BBSs is Starlight Answering Machine, which appears on just about every network, frequently as STARLIGHT.LZH. When your BBS is down for maintenance, this program lets callers know when to expect it back in operation.

This is just a small sampling of BBSs and related files on the nets. Now that I've warned you of the pitfalls of sysop-hood, I can, in good conscience, recommend that you download a snazzy new BBS. Just be sure to set aside some time to run it.

BIX
800/227-2983
617/354-4137

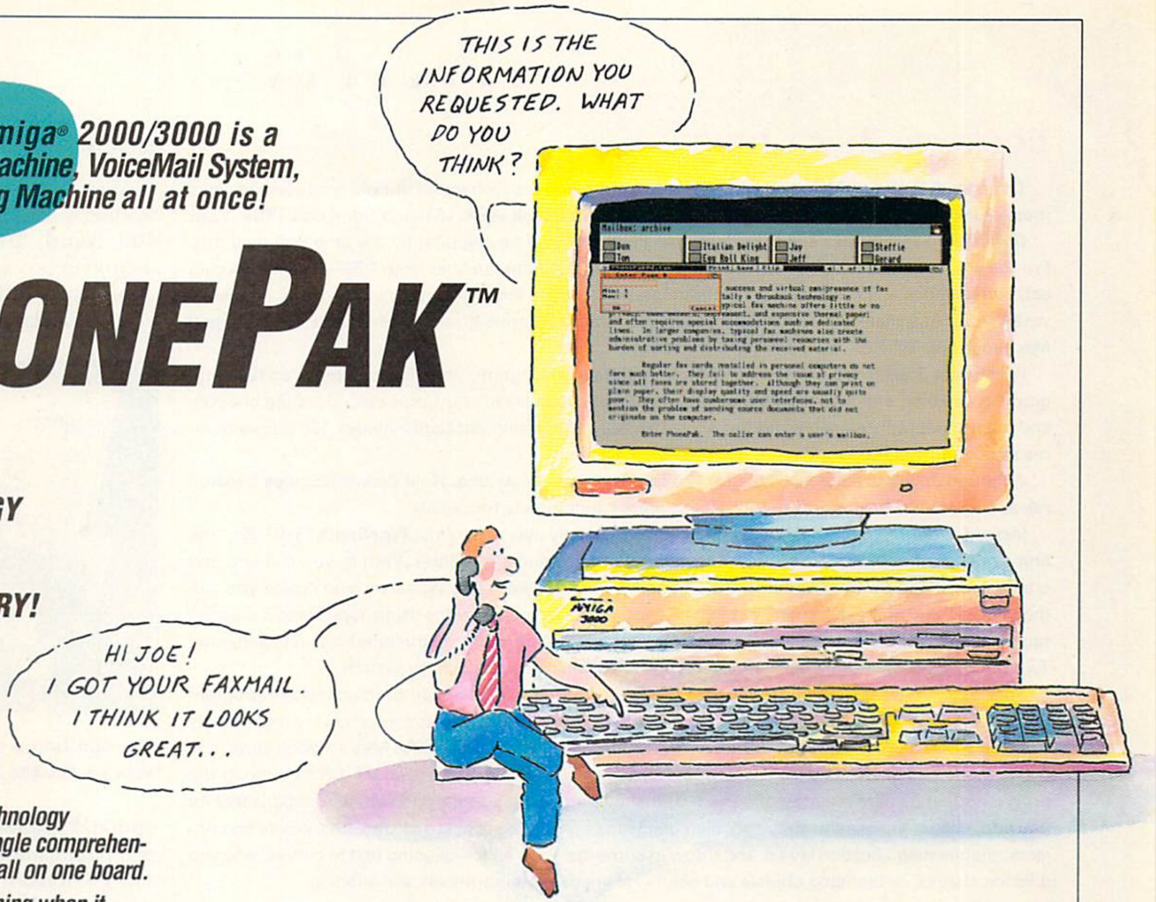
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And because PhonePak uses GVP's custom DMA chip technology for multitasking, you can keep right on working, even while PhonePak is taking calls.

PhonePak Saves Time and Money

With PhonePak, you get a powerful, yet affordable, fax and voice messaging system that:

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- Lets the caller decide whether to leave a message or speak with the called party.

And, you get something no other fax machine or computerized fax product can offer — privacy for every fax received.

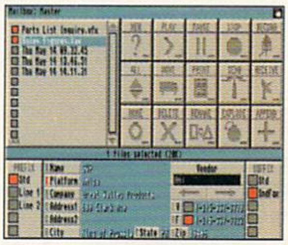
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PhonePak requires 2MB RAM and a hard drive, and is FCC certified for use in the United States.

Polished Publishing

The annual World of Amiga show in Toronto introduced only a handful of new products this year, most of them coming from desktop-publishing pros Gold Disk (RS# 131) and Soft-Logik (RS# 132).

Gold Disk's **PageSetter 3** and **Professional Page 4** should be shipping by the time you read this. Pro Page 4, available to 3.0 owners for $75, promises full compatability with CBM's new AGA chip set, and includes a hot-linked paint program/graphics editor for making quick changes to images in your layout. And thanks to new import filters, you can incorporate graphics generated in IBM PC and Macintosh GIF, TIF, PCX, BMP, and EPS formats.

PageSetter 3 ($99), Gold Disk's entry-level page-layout program, provides an integrated text- and graphics-creation and layout solution, with its layout capabilities, word processor, spelling checker, and color paint program all linked together. The AGA-supporting package includes 120 pieces of hi-res structured clip art.

Although details are not available for Pro Draw 4 as of this writing, Gold Disk anticipates a March release for the AGA-supportive software. Contact the company for details.

Instead of upgrades, ***Soft-Logik*** announced some totally new programs. **TypeSmith** ($199.95), "the first Amiga font outline editor," promises professional editing capabilities. With it, you can edit and create PostScript, Compugraphic and Soft-Logik's own outline fonts. Whatever you create you can then save in any of these formats or in PostScript Type 3 format. Besides using TypeSmith's drawing tools to create faces, you can also import characters and symbols from structured-drawing software. TypeSmith supports both ARexx and Soft-Logik's HotLinks data-exchange system.

Also totally new (albeit long-awaited) is Soft-Logik's **Art Expressions!** structured-draw program ($249.95). The software supports all the major standards, allowing you to convert and load files directly from Gold Disk's Pro Draw, Oxxi's Aegis Draw, Stylus' ProVector, and from the Mac's Adobe Illustrator. It also loads and saves its own PostScript files, Encapsulated PostScript, and IFF DR2D. Among the program's features are an array of basic shape and complex path tools, and editing functions that let you add, delete, move, join, split, and align points in objects. You can also close paths, create text objects, change magnification levels, and throw in some special effects—aligning text to curves, warping it inside shapes, or blending objects and colors for shape metamorphosis and shading.

Increased Force

If you've got Great Valley Products' G-Force 040 accelerator for the A2000, you can increase the speed of your floating-point intensive operations simply by adjusting the syntax of your start-up file. Product manager Gary Nush explained that G-Force 040 owners should find the line in the user-startup file that reads:

GvpCpuCtrl >nil: FastROM

and change it to:

GvpCpuCtrl >nil: FastROM MoveSSP

According to GVP, this modification results in rendering-speed increases up to 550 percent. Nush notes that the newest version of the install disk (1.2) will incorporate the new command into the user-startup file. (RS# 134.)

Buy Monthly

Want to build your collection of textures and backgrounds on a regular basis? Every month, ***DRC Sequential Graphics***' releases a new **Digital Collage** package—two disks containing ten texture files, five 16-color full overscan backdrops, and five to ten DPaint motion clips. You can buy a 6-, 12-, or 24-month subscription for $30, $587, or $100, respectively. (RS# 129.)

If You've Got It . . .

Several shows will flaunt the latest Amiga technology in the coming months. Here's the most recent listing:

Image World West *
February 2-4
San Jose Convention Center
San Jose, CA
914/328-9157

Image World—The Government Show *
March 17-19
Sheraton Washington
Washington, D.C.
914/328-9157

World of Commodore
April 2-4
New York, New York
416/285-5950

NAB (National Association of Broadcasters)
April 19-22
Las Vegas, NV
202/429-5300

* Image World shows incorporate Video Expo and CAMMP

Look, No Hands!

After building its reputation with hand scanners, ***Migraph*** now releases the **PS-400 Wand**, a full-page (8-1/2X14-inch) monochrome scanner. According to Migraph, the wand offers many of the advantages of a flatbed scanner (including an optional $249 sheet feeder to process several pages automatically) at a lower price. The PS-400 offers four dither patterns for scanning colors and halftones, including an 8X8 pattern that provides up to 256 gray scales via software conversion, plus a line-art/text setting, three text-scanning resolutions (200, 300, and 400 dpi), and 31 resolutions for image scanning (from 100 to 400 dpi in 10 dpi increments).



Migraph takes a hands-off approach with its PS-400 Wand scanner

The Wand comes bundled with Migraph's Touch-Up software for $799; for another $100 you also get Migraph's Optical Character Recognition (OCR) software. And if you already own a Migraph or Golden Image hand scanner, you can trade up at a special price directly through Migraph. (RS# 128.)

Minding The Store

Running low on cache? When your next paycheck comes in, you might part with a few bucks for ***Silicon Prairie***'s **HyperCache** ($49.95), a file-system and device accelerator.

HyperCache Professional was designed to work with any device, regardless of its type or the file system you use. Silicon Prairie has tested the software on equipment ranging from C Ltd.'s controllers to the latest CD-ROM systems. And it reports success, particularly with OldFileSystem, FastFileSystem (all versions), CrossDOS, Multi-DOS, and Commodore's A590. Accelerated systems show the greatest benefit, and 68030/68040 versions are available as well.

The software automatically configures itself to a 512K cache, which you can adjust. In addition, you can alter the geometry in terms of the number of lines, sets, and prefetch. (RS# 130.)

GVP Enters the SOUND ZONE

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With the most powerful, comprehensive 8-bit Digital Sound Package to ever orchestrate an Amiga

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With a high-quality stereo sound sampler, A fast, powerful, easy-to-use sound editor, And a self-contained 4-track sequencer.

For all the sound effects and music you could ever imagine.

▶ **Record** sound samples from any source, including voices, noise, and pre-recorded instruments, to create your own instruments and effects.

▶ **Edit** sounds quickly in real time. Add effects like reverb and echo, run sounds backward, alter wave forms, cut and paste sound segments, create loops, eliminate pops and scratches.

▶ **Compose** easily using the DSS 4-track sequencer and your Amiga or MIDI keyboard. Draw from up to 31 instruments at a time, in up to four octaves with 8 different variable effects. Mix and modify sounds in real time as you compose, through direct interface with the sound editor.

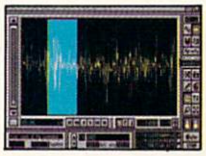
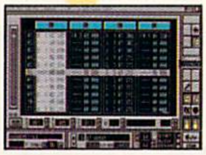
DSS Stretches the outer limits of 8-bit sound

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- Remove "pops" from old phonograph recordings.
- Create custom instruments and sound effects by collecting and/or modifying pre-recorded instruments, voice, or sounds from any source, and use them in your own compositions.
- Save your sound and music to disk or send it out via modem for replay on any Amiga.




Check out these unparalleled features

✓ AmigaDOS 2.0 compatible; written in assembly language.
✓ Multi-tasking operation.
✓ 68020 and 68030 compatible.
✓ Comprehensive tutorial manual helps even beginners get started right away.
✓ Intuition-based graphic interface makes operation easy.
✓ MIDI-in capability.
✓ Direct interface between sequencer and editor.
✓ Hold 31 sound samples in memory at once – all shown on screen so they are easy to manipulate.
✓ Effects and processing capabilities include echo, mix, filter, re-sample, sound data inversion, playing sounds backwards, loops, fade-in/fade-out and more.
✓ Manipulate sound samples in real time, as you listen.
✓ Create sampled instruments with 1, 3 and 5 octaves.
✓ HIFI recording for highest quality playback.
✓ Controls for faster/slower playback and filtering high frequencies during playback.
✓ Load and save samples, songs and instruments in multiple formats.
✓ Multiple effects for each note.
✓ Stereo and monophonic operation. Also convert mono to stereo or separate stereo.
✓ Auto-playing music modules.

✓ Real-time oscilloscope and spectrum analysis.
✓ Real-time reverberation.
✓ Graphic editing of wave forms through easy-to-use functions, including zoom in/out and precision controls for position, frequency and amplitude.
✓ Draw sound waves freehand using the mouse.
✓ Direct editing of individual sample numeric values.
✓ Maximum recording speed of 51,000 samples/second (38,908 samples/second in stereo).
✓ Savable Preference settings.
✓ Saves in IFF, SONIX or RAW formats.
✓ Compatible with SoundTracker, NoiseTracker and SoundFX modules.

DSS 8
DIGITAL SOUND STUDIO



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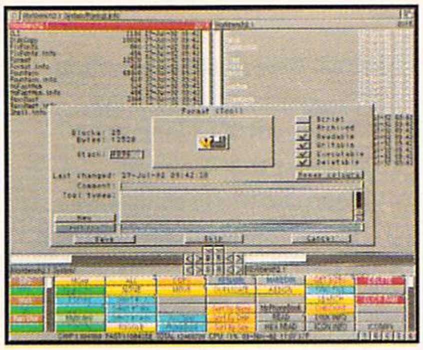
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MAKING THE UPGRADE

On the upgrade log this month are a language, a directory utility, and a fax modem.

Blitz BASIC has been enhanced with an extended command set for writing entertainment software, plus 300 new commands for applications developers. Now handled by ***Acid Software***, **Blitz BASIC 2** ($159) supports C-type structures, macros, and linked lists. A library management system lets you add your own commands and import others from such standard Amiga libraries as midi.library, arp.library, and so on. Blitz 2 compiles source code into small, 100-percent machine-code stand-alone programs. The upgrade features an inline assembler and supports recursive procedure and function calls. In addition, it comes with an applications designer and five arcade games.(RS# 135.)

AGA compatability is first on the list of new features for ***INOVAtronics***' popular **Directory OPUS 4.0** disk- and file-management program. After that come increased audio- and image-file support, greater customizability, and a more flexible, intuitive interface. ARexx support has been expanded to encompass more than 100 commands, and a new hotkey feature lets you launch any Amiga application from the keyboard so long as OPUS is either running or iconified. New print facilities let you output individual frames from full screen and brush animations. A font-view facility lets you print an entire alphabet of any font. (RS# 136.)



OPUS 4 gives you more of what you buy a directory utility for.

Users of ***Supra***'s **SupraFAXModem** v32 and v32bis can upgrade to the latest chips, which offer such enhancements and new features as error-correction mode (ECM) and The Silent Answer. ECM ensures the accuracy of fax transmissions when used with fax software (such as FaxTalk Plus) that supports it.

With The Silent Answer, you can use a single telephone line for both voice and fax communication. If the FAXModem detects fax "CNG" tones on an incoming call, it routes the call to the fax software. Otherwise, the modem sits silently on the line while you pick up the call. This free upgrade also improves busy-signal recognition, &V modem settings, v32/v32bis negotiation, and more.

For an additional $49, those who have Caller ID capabilities (available through many local telephone companies) can identify incoming calls by date, time, and telephone number prior to answering.

Because of a reported high demand for this upgrade, it is not being made available to call-in customers: You must order it through the Supra forum on CompuServe (type GO SUPRA to enter the forum), Supra's BBS (503/967-2444), or by writing to the corporation. (RS# 137.)

FUTURE SHOWS AMIGA BRIGHT IN BRITAIN

LONDON, ENGLAND—November saw the Future Publishing 16-bit show at Earl's Court in London, which seemed at first to be nothing more than a competition amongst the exhibitors to see who had the loudest PA system.

Commodore's presence was as exciting as it was varied. Center stage was shared by the rapidly expanding selection of CDTV titles, and the **A4000** and **A1200** ranges. The A1200s pricing is aggressive by British standards, £400 buying a single-floppy, 2MB machine, and it is clear that CBM has high hopes for its newest fledgling. Power users and spotty games players dribbled in unison over the A4000, which demonstrated just how fast DPaint IV can run.

Ocean Software has tied up several major licences, with such titles as **WWF European Rampage** (those nice men in leotards attempt to knock the living daylights out of their European counterparts), **Lethal Weapon**, and **Universal Monsters** (which brings Dracula, Frankenstein, The Mummy, and other favorites back to the small screen). (RS# 120.)

Domark had various new products on display, including **version 2** of **3-D Construction Kit**, which claims to offer home virtual reality and a whole host of improvements over the original. **Rampart**, a new game, combines strategy with destruction for an effect described as "like playing Tetris with cannons." **AV8B Harrier Assault** promises a multirole strategic, tactical, and operational gameplay scenario. (RS# 121.)

Gremlin has been busy producing **Nigel Hansell's World Championship**, a Formula One racing game that offers 16 different circuits. For those who prefer to race on the highway, **Lotus 3—The Ultimate Challenge** provides some great arcade or competition driving, along with a course designer. (RS# 122.)

Psygnosis is ready to release **Lemmings II**, which promises to be just as successful as the original. Also due out soon are **Bill's Tomato Game**, an indescribably strange affair in which you assist a tomato across a screenful of obstacles with portable fans, springs, and so on, and **Walker**, a shoot-em-up with the roles reversed: you defend your robotic walker from a human onslaught. (RS# 123.)

Serious uses for the Amiga were also represented. ***Digita International*** launched **Wordworth 2**, a multifeatured word processor with a sharp display and good print output even on inexpensive printers. (RS# 124.) ***New Dimensions***, which is seeking a US distributor, demonstrated the excellent **Technosound** eight-bit sampling system (RS# 125). Two new scanners, one hand-held and one color, were also on display.

The Amiga's near domination of the European leisure computer market is now more evident than ever. What is clear is that Commodore at least has its pricing right and software producers have responded to increasing sales. With the new 32-bit machines and continuing strong sales of the first generation Amigas, the future is so bright I've got to buy shares!

—Stuart Menges

WHAT'S YOUR VECTOR?

Wesson International has three new add-on sector disks ($19.95 each) for its **Tracon Air Traffic Control Simulator**. The new disks—Canada, The Pacific, and Australia—include a total of 23 international sectors designed to operate with Tracon II.

The Canadian Sector Disk contains airspace for Toronto, Quebec, Montreal, Calgary, Winnipeg, Vancouver, and Anchorage, Alaska. Included on the Pacific Sector Disk are Tokyo, Manila, Taipei, Singapore, Kuala Lumpur, and three Hawaiian sectors—Hawaii, Oahu, and Kauai. The Australian Sector Disk, designed by Australian Air Traffic Control instructors, includes Sydney, Melbourne, Adelaide, Perth, and Brisbaine, as well as three New Zealand sectors—Wellington, Auckland, and Christchurch.

Each of these disks also includes complete voice files and customized aircraft files appropriate to the location to provide the user with a more realistic traffic mix for each sector and airport. (RS# 133.)

Send news, new products, and network information to Overscan, *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458. ■

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Carsmear by Mike Vunck

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★ Generate single and dual image morphs; wave, ripple and spiral effects; water and glass-like distortions; and a wide range of 24-bit transitions.
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ImageFX is the most exciting and versatile full color, image processing and enhancement system ever made.

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Final Copy™ II

Final Copy II produces high quality, professional looking documents. It combines advanced word processing features, easy-to-use page layout capabilities, and state-of-the-art printing technology into one convenient program.

While other programs claim to have quality printing, Final Copy II is the only word processor on the Amiga that will produce excellent quality printouts on any Workbench (1.3, 2.0 or higher) supported graphic printer. If you have a PostScript printer, Final Copy II is the only word processor on the Amiga that has true WYSIWYG PostScript print capabilities - other programs limit you to a few fonts and a limited number of sizes. With Final Copy II you get the same great looking output produced in expensive desktop publishing programs.

Final Copy II's word processing features include: 144,000 word speller; 1.4 million response thesaurus; automatic hyphenation; named paragraph style sheets; master pages; mail-merge; multiple newspaper style columns; search and replace; header and footer support; left, right, center and decimal tabs; paragraph justification; and automatic date, time, and page number insertion.

Final Copy II's graphic features include: object-oriented, structured tools for drawing boxes, ovals, lines, arrow-tipped lines, and rounded cornered boxes; graphic object color fill, line weight and line color; ability to import IFF ILBM pictures and brushes including 24 bit ILBM and HAM; real-time text flow around any graphic; graphic sizing; cropping; object locking; and graphic depth arranging.

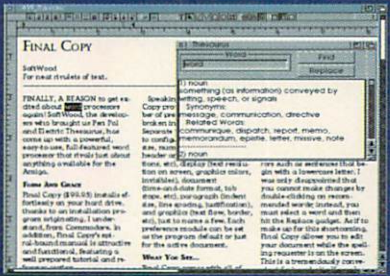
Final Copy II's outline font features include: 35 outline typefaces; font sizing from 4 to 300 points; variable line spacing; compressed and expanded character widths; underline, strikethru, and small caps styles; superscript and subscripts; positive and negative text obliqing; and color text.

Final Copy II's user interface features include: command ribbon; real-time scrolling; ARexx port; magnified and reduced editable page views; user preferences; WB 2.0 look and feel; mouse zooming; mouse document panning; horizontal and vertical rulers, and page guides.

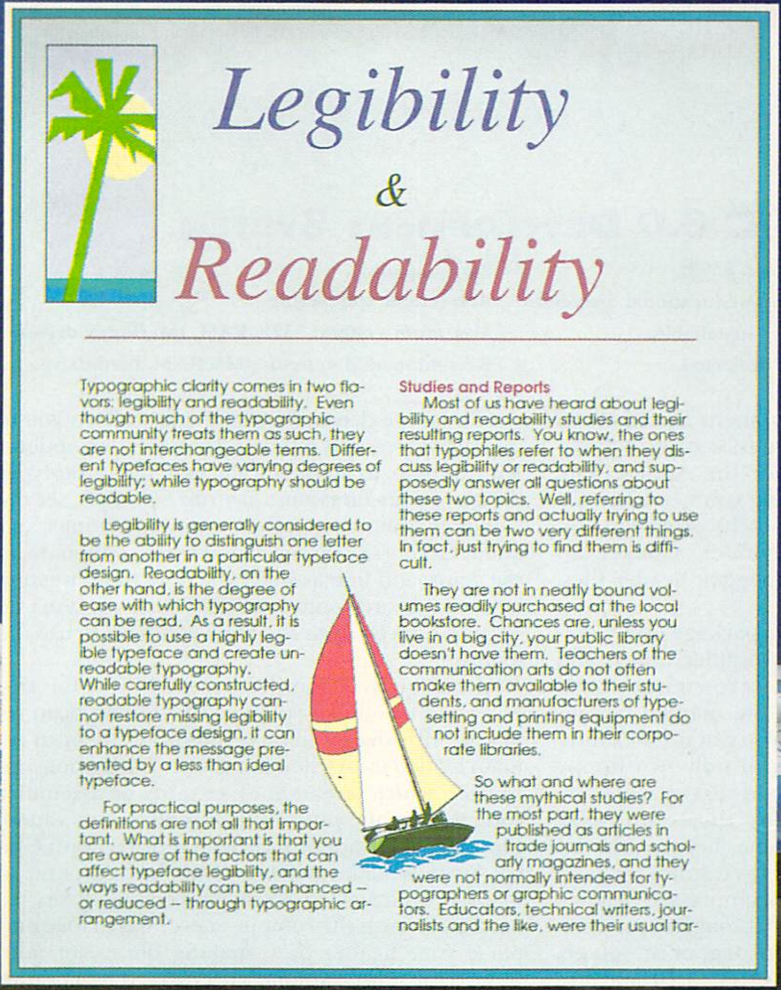
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Legibility & Readability

Typographic clarity comes in two flavors: legibility and readability. Even though much of the typographic community treats them as such, they are not interchangeable terms. Different typefaces have varying degrees of legibility; while typography should be readable.

Legibility is generally considered to be the ability to distinguish one letter from another in a particular typeface design. Readability, on the other hand, is the degree of ease with which typography can be read. As a result, it is possible to use a highly legible typeface and create unreadable typography. While carefully constructed, readable typography cannot restore missing legibility to a typeface design, it can enhance the message presented by a less than ideal typeface.

For practical purposes, the definitions are not all that important. What is important is that you are aware of the factors that can affect typeface legibility, and the ways readability can be enhanced -- or reduced -- through typographic arrangement.

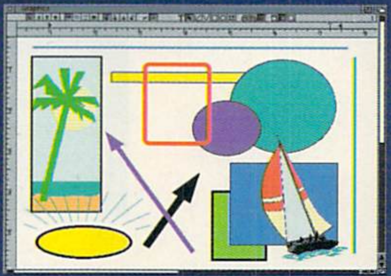
Studies and Reports

Most of us have heard about legibility and readability studies and their resulting reports. You know, the ones that typophiles refer to when they discuss legibility or readability, and supposedly answer all questions about these two topics. Well, referring to these reports and actually trying to use them can be two very different things. In fact, just trying to find them is difficult.

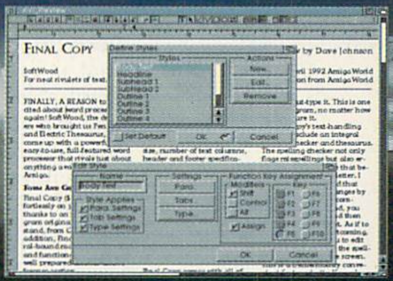
They are not in neatly bound volumes readily purchased at the local bookstore. Chances are, unless you live in a big city, your public library doesn't have them. Teachers of the communication arts do not often make them available to their students, and manufacturers of typesetting and printing equipment do not include them in their corporate libraries.

So what and where are these mythical studies? For the most part, they were published as articles in trade journals and scholarly magazines, and they were not normally intended for typographers or graphic communicators. Educators, technical writers, journalists and the like, were their usual tar-

Actual Final Copy II printout.



Final Copy's™ graphic support is the best there is in any Amiga® word processor. Place IFF ILBM pictures and brushes anywhere in a document. Draw boxes, ovals, lines, arrows, squares, and circles using Final Copy's™ structured drawing tools. Flow text around or on top of any graphic in a document.



Style sheets and master pages are features you can really use to ensure your documents are created in a consistent and well-planned manner. Fully editable page views let you work in several levels of reduction and magnification. Multiple snaking columns, left/right pages, and title page options are easy to use.

Comparison Chart	Outline Fonts Included	Style Sheets	Master Pages	Line, Box, Oval Drawing Tools	PostScript™ Support	Thesaurus Responses	Speller Words	Automatic Hyphenation
Final Copy II	35	Yes	Yes	Yes	Excellent	1.4 million	144,000	Yes
ProWrite 3.3®	0	No	No	No	Limited	300,000	100,000	No

Comparison Chart	Snaking Columns	24 Bit ILBM Support	Editable Page Views	Outline Font Processing	Print 1 pg. Document	Math Support	Outline Fonts 1.3 and 2.0	Print Quality
Final Copy II	Yes	Yes	25-400%	Fast	53 sec.	Yes	Yes	Excellent
ProWrite 3.3®	Yes	No	No	Slow	2 min. 5 sec.	No	No	Fair

System Requirements: Amiga® with at least 1 megabyte of RAM and either a hard drive or 2 floppy drives.

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R E V I E

SAS/C 6.0 Development System

C language Software development.

SAS Institute, **$399; $197.50 with educational discount. Hard-drive installable. Not copy protected. 2.0 compatible. Accelerator compatible. Minimum system: 512K RAM, two floppy drives. Recommended system: 4MB RAM, hard drive.**

The SAS/C 6.0 Development System from SAS Institute is the most complete C development system for the Amiga. The package has everything you need to write top-notch (and not so top-notch) programs, including a compiler, an assembler, a linker, an optimizer, a text editor, a debugger, header files, on-line help, and utilities.

Installation is a breeze. The package uses Commodore's new menu-driven Installer utility, and there are several options that let you select exactly what is installed. Although the manual recommends you have a hard disk, you can install a minimal system on an Amiga with only two floppy drives. If you have enough hard-disk space, I recommend you avoid installing the compressed headers. This takes a long time, because the installer compresses the headers as it stores them on your drive. Besides, having uncompressed headers around means you can browse through them when you need to look up a structure, tag, or prototype. If you are upgrading from SAS/C 5.10 and use TOUCH and WC, I suggest that you save these to the SC:c directory after installation and before you wipe out the older version, as these utilities are not included in the new package.

A Major Makeover

If you are used to SAS/C 5.10 or earlier Lattice versions, you will first notice that everything has changed in 6.0. All Lattice references are gone. The front-end driver, LC, has been replaced with SC, which handles compiling, linking, and library, symbol-table, and prototype generation. BLINK, the overlay linker, is now SLINK, and LMK, the make utility, is now SMAKE. Previous cryptic command-line options have been mercifully replaced with Amiga ToolType-style options that are easier to remember.

To locate the vendors of the products reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 114.

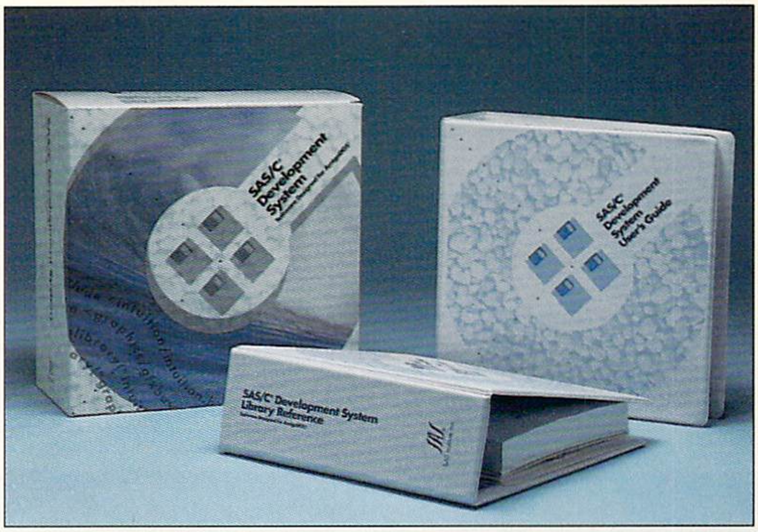
The mouse-driven SCOPTS utility allows you to interactively modify all compiler and linker options. For example, to automatically generate prototypes for all of your functions, just run SCOPTS, set the Generate Prototypes option, save your settings, and build. Of course, you can change these options from the command line as well. The only thing missing here is keyboard control of SCOPTS; if you don't set options directly from the Shell you have to use the mouse.

The two-pass compiler executables (LC1 and LC2) and the global optimizer (GO) have been replaced with shared libraries, allowing them to remain loaded even when not in use. A peephole optimizer, which streamlines sections of assembler code for specific processors, has also been added. Precompiled headers have been replaced with Global Symbol Tables (GSTs), which hang around in memory until needed. If you have enough RAM, using GSTs means the compiler never has to load and parse your header files, making life easier (and faster!) for those without hard disks. The libraries and GSTs are automatically unloaded from the system as needed when memory gets low. SC and SLINK are pure so you can make them resident.

CPR, the source-level debugger, has been improved substantially and is Workbench 2.0-compliant. Some new functions have also been added, including support for debugging multithreaded programs and cross debugging; you can connect two Amiga with a null-modem and debug with CPR on the second. As an added bonus, if you run Enforcer, Bryce Nesbitt's popular debugging tool that uses the MMU of a 68020 or greater CPU to trap bad memory accesses (called hits), CPR automatically stops where the hit occurred. As quality expectations increase, users will begin to reject software that insists on causing Enforcer hits, so this is an excellent feature. As Amiga developers and Commodore's programmers will tell you: "No program should cause an Enforcer hit, ever!"

SE, the screen editor, has been enhanced and

W S



The SAS/C 6.0 Development System sets an Amiga standard.

now provides extensive ARexx control, allowing you to compile files and build projects using ARexx scripts. A new utility, SCMSG, is an ARexx-controllable message browser that you can configure to pop up automatically when errors or warnings occur. You can also configure it to run SE or your favorite ARexx-controllable editor and place the cursor on the offending line when you select a message from its window.

Compliant and Vigilant

Probably the best new feature is the inclusion of ANSI-compliant standard C libraries and headers. Now you can port from and to UNIX without having to create replacements for missing functions. You can even use an option that tells the compiler to notify you if you stray a bit from true ANSI conformance.

Also included are the latest 2.0 header files from Commodore. These are perfectly usable under 1.3 as well, as long as you don't try to use 2.0-specific features without first verifying that your program is running under 2.0.

In addition, SAS/C comes with some utilities and icons to facilitate program development under Workbench. One utility sets up an empty directory with default options and a project file. To build your project, just double-click on your project icon to invoke SMAKE. Icons for running SCOPTS and CPR are also provided.

Many less obvious enhancements have been incorporated, as well, such as automatic Library initialization, user auto-init functions, and function inlining. Automatic library initialization forces the startup code to handle opening and closing libraries for you. Auto-init and auto-exit functions let you specify functions which are called before *main()* and after *exit()*, providing more flexible initialization and better error-handling. Function inlining lets you write functions that are substituted, much like macros, directly into the code at compile time.

Several standard startup modules have been included, along with source, that allow development of different types of programs: *cres* is used for residentable programs; *cback* is used for programs that run and detach themselves from the Shell, eliminating the use of loader utilities such as runback; and *catch* is used while debugging your program and will generate a trace of your code as it runs.

Pragmas, which are provided for the Amiga standard libraries, can be used to bypass the stubs found in amiga.lib. This can speed up your program and reduce code size immensely, and is required when writing pure residentable code.

When you get right down to it, efficiency is important, and in this respect you won't be disappointed. Compiling and linking are much faster than before, mostly because of the global symbol tables and memory-resident shared libraries. About the only thing that needs to be loaded when you compile is your source. But the actual code generation has been improved and sped up, and the linker, which was quick before, is now very fast! Naturally, the more memory you have, the faster it will work.

Hand Holding Off and On Line

The documentation is terrific. It comes in two large binders. One contains information on the compiler and development tools, error messages, and Amiga-specific features, and the other houses a complete library reference. All information is well-indexed and organized. There are even sections that help you port programs from Lattice and Manx environments. Also supplied is a smaller booklet with brief listings of all the compiler options, CPR functions, and library functions, with references to specific pages in the manuals. This makes it very easy to look up functions without consulting an index.

For faster answers, try the new on-line help facility. SAS/C is shipped with AmigaGuide, Commodore's hypertext help program, and all the printed documentation is available in various guide files. You can look up compiler options, CPR functions, messages, utility descriptions, and library functions, all from within SE and CPR or with an included pop-up help utility. You can even browse header files and global symbol tables!

SAS/C is a fast, full-featured C development system from a company that stands behind the Amiga and provides quality software and support. If you program in C on the Amiga, from simple ANSI-compliant Shell utilities to full-blown multithreaded Workbench applications, there is no substitute to the SAS/C 6.0 Development System.

—*Paul Miller* ►

Professional multimedia production, creation, and development.

SCALA MULTIMEDIA 200

Scala, $495.
Hard-drive installable.
Copy protected with dongle.
2.0 compatible.
Accelerator compatible.

Minimum system: 2MB RAM, 1MB chip RAM, hard drive.
Recommended system: 3MB+ RAM, 1MB+ chip RAM, hard drive, accelerator.



Scala Multimedia 200 lets you easily reorganize your production.

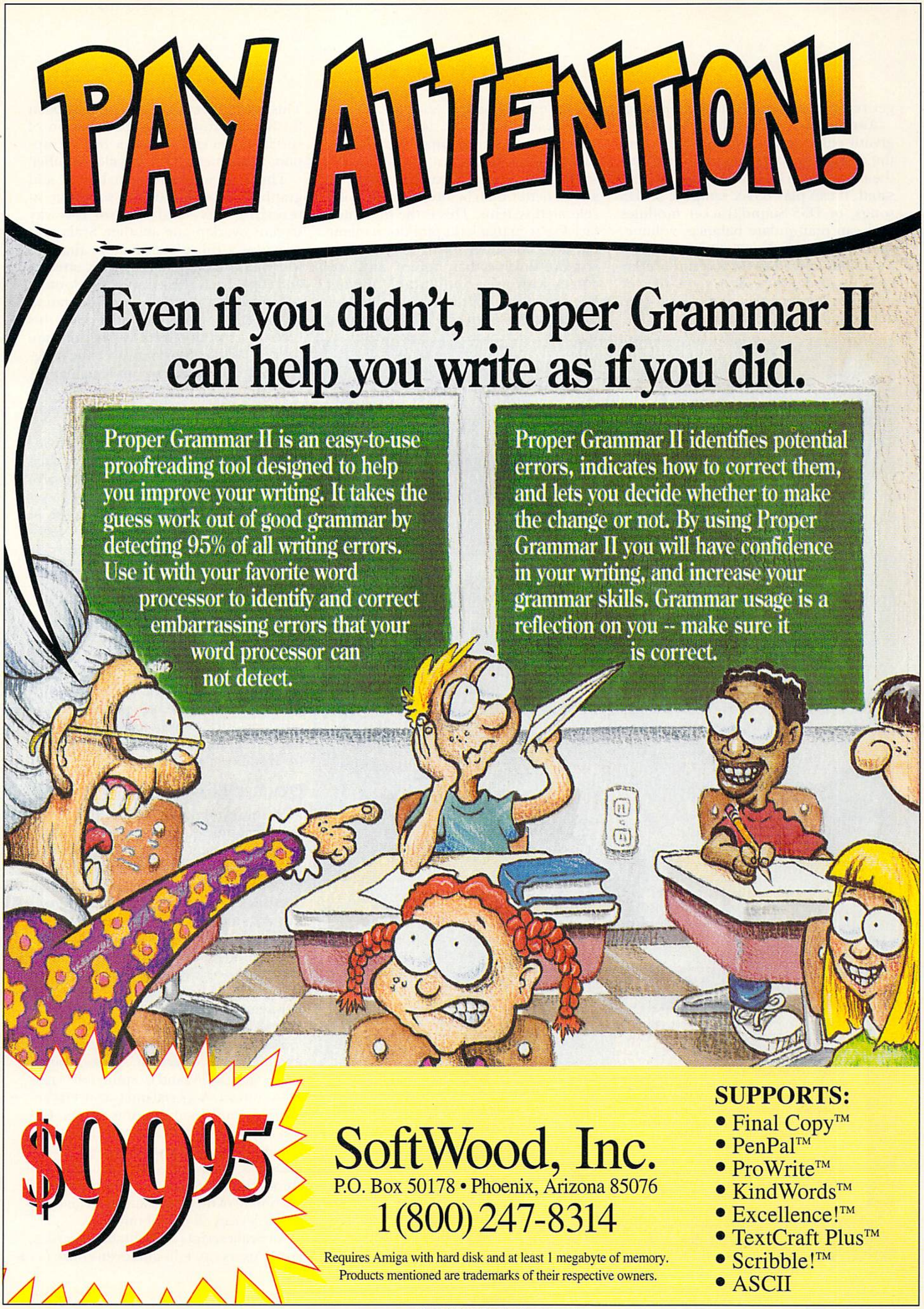
If the software battles of the last decade were fought over offering better methods of processing data, the industry wars of the '90s will be fought over presenting that information in new and exciting ways. Suddenly graphics, sound, and animation are the tools of the trade, and companies connect with their audiences only if they present the material in an engaging way. Full-motion video, still-video snapshots, laserdiscs, and CD-quality sound have become the crucial commodities in the graphics-presentation market.

Amiga presentation software takes another great leap forward in these vital areas with Scala Multimedia 200 (MM200). This program redefines the standard in power and ease of use not just for Amigas, but for all computer platforms.

Scala Multimedia is a great improvement over the first release. Where the original was adept at creating stand-alone applications with moving text and gorgeous backgrounds for video titling, the new version is a real tool for multimedia professionals. Plus, it's even easier to use. It can create everything from information-kiosk displays with impressive laserdisc video sequences to interactive-training programs with synchronized, customized voice-overs to business presentations with Xapshot photographic backgrounds. It takes a powerful system to run Scala, but the program gives back a lot more than it asks for.

EXCELLENT EXPANSION

The most significant improvement over the original Scala is MM200's system for easy control of such specialized input sources as laserdiscs, still-video players (Canon's Xapshot, for example), MIDI playback, and CDTV audio. The Scala EX external program system lets you load special modules that link powerful devices to the easy-to-use interface. The publishers have promised to follow up with new modules, opening up a larger world of fantastic audio and video, including VTRs and 24-bit graphics boards. Putting such heavy-duty hardware in the hands of Amiga users is no small matter. Because video is rapidly becoming the new literacy, this development has the potential to unleash a big- ►



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ger revolution than desktop publishing.

Another important addition is the greatly enhanced sound support. Where the original Scala fell down in this area, the new version has more than compensated. It can play 8SVX samples, SMUS songs, or DSS/SoundTracker modules and can manipulate balance, volume, speed, fade in, fade out, and more. With a sampler and a CDTV, you can overlay customized voice-overs on top of exquisite, high-quality audio, and even add sound effects to the mix.

The editing screen shows some impressive improvements, as well. Its layout is still thoughtfully organized, and its functioning is still smooth as silk, but the scrolling is cleaner. Text flies across the screen better than before, even on unaccelerated systems. This is the first interface I've seen that lacks pull-down menus but does not suffer for it. The interface is more flexible than before, and now comes with user-configurable menus. You can create your own paths between menus, streamlining the design process. This intuitive editing system has been further improved with the addition of special video effects, better button support, and a preview mode called Shuffler.

The new video effects make text and graphics fly on and off the screen in interesting ways and control the way screens overlap one another. Scala now provides a full plate of more than 80 wipes and fades, such as flow, stretch, and cube. Each effect is selected through an icon with a shorthand representation of the effect. Scala Inc. advertises this striking array of effects as "the software toaster." While this claim is a trifle exaggerated, the results are undeniable. It's hard to believe that these incredible effects are all happening without additional hardware.

The new button system simplifies making screen hot spots, setting variables, and branching through the program. Creating a branch to a page causes the editor to display the new page in miniature, giving you immediate feedback. You can launch new scripts or whole programs from the buttons. MM200 does not have all the programming resources of such programs as Can-Do (INOVAtronics) or AmigaVision (Commodore), but it is easier to use.

The very useful Shuffler lets you view the whole presentation in miniature. It provides a strong sense of continuity by placing as many as 112 pictures on the screen at once, storyboard style. You can then drag and shuffle these miniatures for instant script changes.

Quicker Loads

Most multimedia systems suffer from long load times. The sense of immediacy and involvement are lost if the user has to sit through an extended pause while the system loads large sound and animation files. Scala Multimedia addresses this with a package of speed techniques such as buffering, planned preloading, and the ability to play animations and digital video directly from the hard drive. These features can really boost performance, especially on systems with a lot of RAM.

Rounding out the package is support for ColorFonts, overscan, ARexx, Digital Creations' DCTV, and Commodore's new AGA chip set. A special utility converts animations, and another prints scripts. Two disks of demos provide an excellent tutorial and are a rich source of ideas. Tying the whole system together is a unique synchronization feature that lets you record the timing of the sound and video and EX input devices all in real time.

All Scala scripts are editable text files. Power users can edit and even construct ►

ANNOUNCING

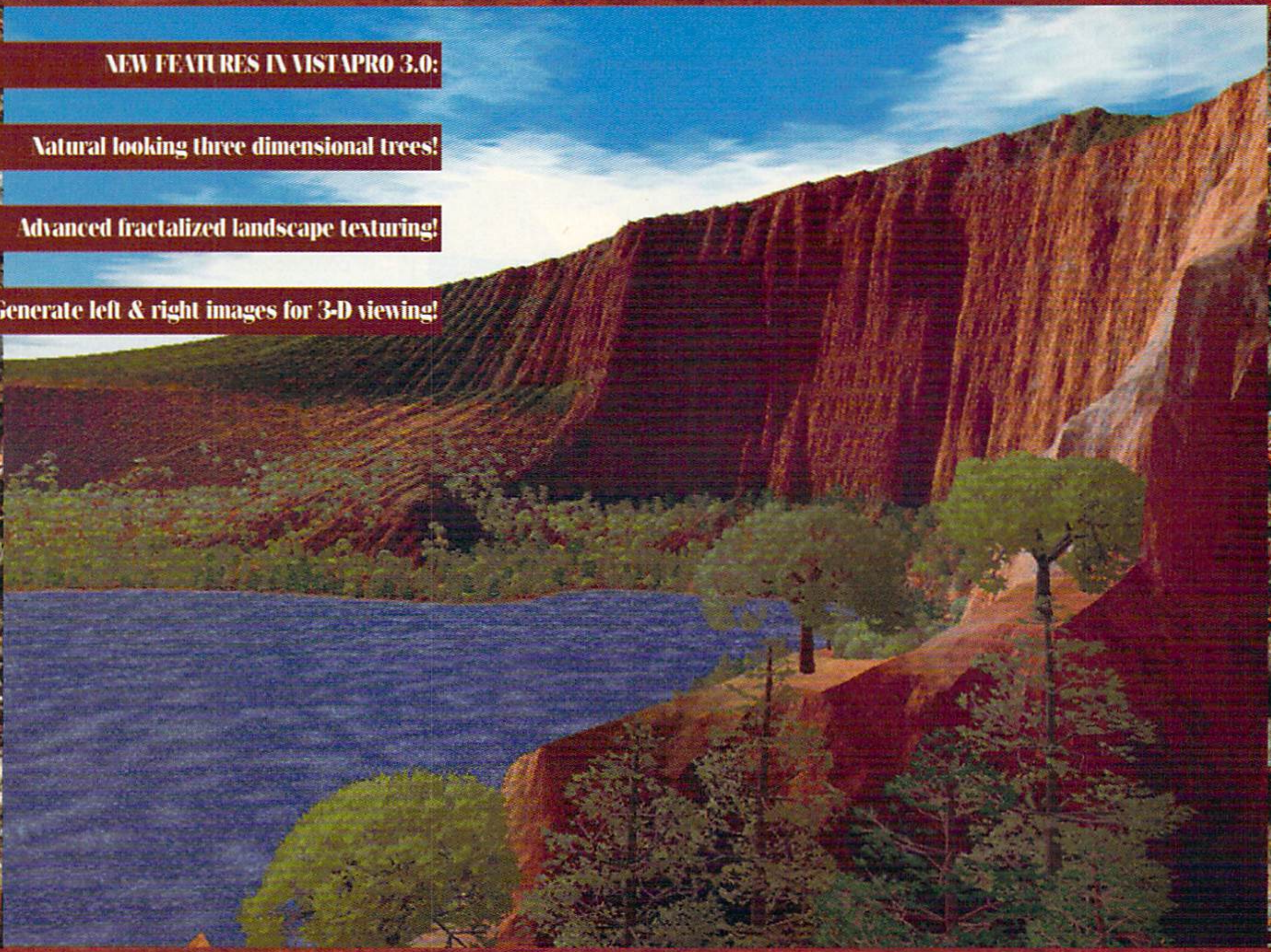
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Circle 58 on Reader Service card.



their presentations using direct, low-level commands. Each command is now properly documented in the manual, as well.

The manual is comprehensive, well-written, and profusely illustrated. It has a tutorial, an extensive reference section, and (finally) an index. Appendices include displays of the 17 fonts and 60 backgrounds available.

Unfortunately, this fast, fun program is not without flaws, and one flaw is serious. First, all Amiga multitasking is defeated while a presentation is running. Second, the program is copy protected with a dongle: a hardware key that plugs into the joystick port. If you ever lose the hardware key, all work must stop until you order and receive a replacement. I can understand the publishers protecting their product from theft by requiring the dongle for creating animations. But they also require the dongle for playback of the stand-alone applications, as well. This means that each run-time Scala presentation must be sold with a hardware key. I fear that this will limit the use of an otherwise excellent program.

Out in Front

Nevertheless, Scala Multimedia 200 is powerful multimedia contender and puts the Amiga squarely in the forefront as the price and performance leader of this critical field. I have used presentation packages on all the major computer platforms, and Scala stands shoulder to shoulder with anything on the PC or Mac, and towers above most of them. Animation and text manipulation are breathtaking even on slow systems, and far smoother than the animations running on even the fastest PCs and Macs.

A considerable level of thought and planning went into this program. The best thing I can say about it is that it works just like you think it ought to. It's easy to build rich presentations without cracking the manual, and that's just about the highest praise I can give a user interface.

—Daniel Greenberg

PhonePak VFX

Great Valley Products, $449.

A2000, A3000.
Internal, CPU slot connection.
Installation: Easy
Hard drive installable software
Not copy-protected
2.0 compatible
Accelerator compatible
Minimum system: 2MB of RAM.
Recommended system: 2MB+ of RAM, 10MB+ of hard-drive space for messages.

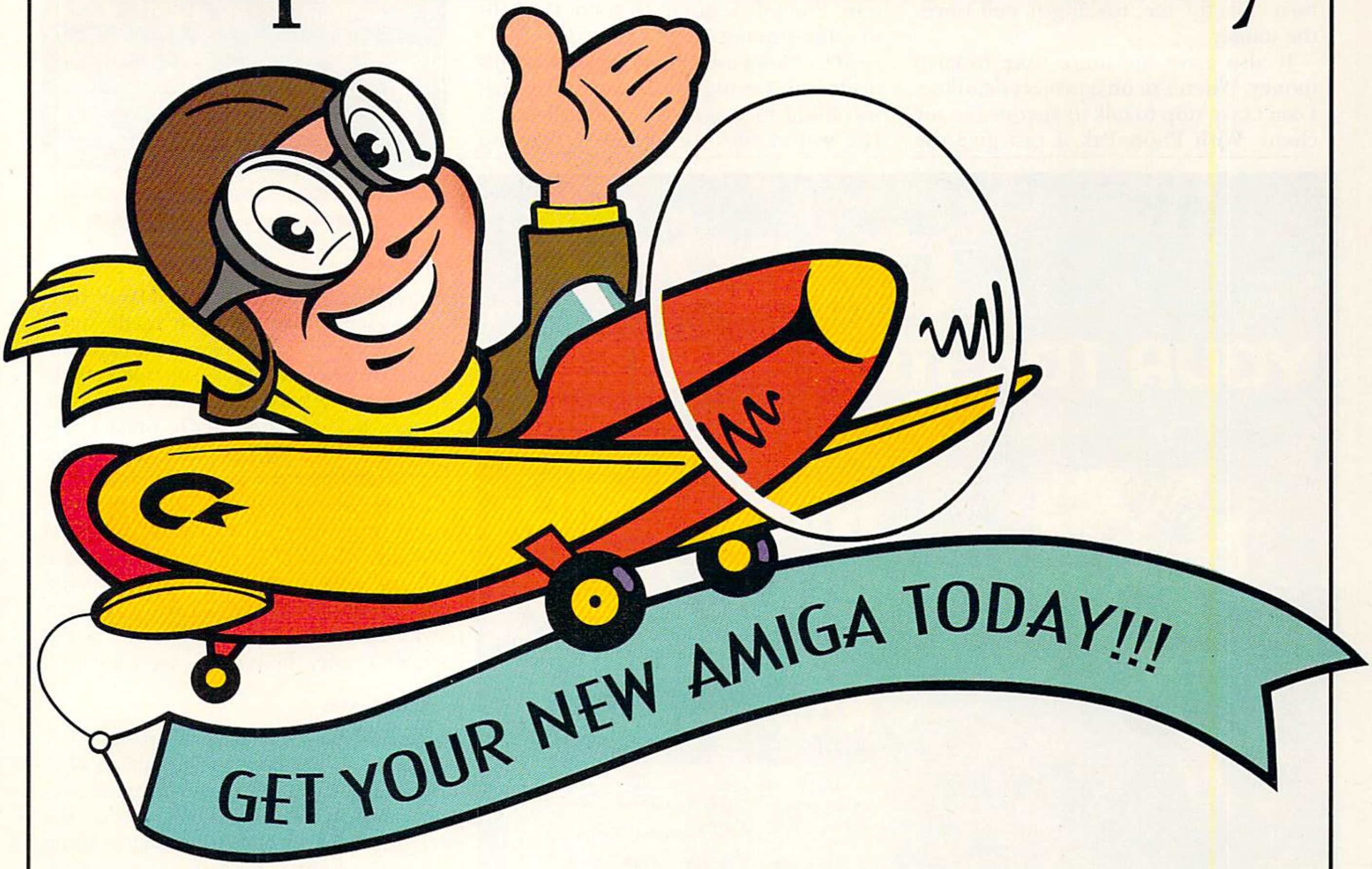
Voice mail and fax management.

A full-featured voice-mail and fax system, PhonePak VFX is one of those products you won't get really excited about until you start to work with it. Then you'll be hooked.

While it can be used in a home environment, this hardware-and-software combination really shines as a business-productivity tool, saving you a great deal of time and money. In my office, I had three answering machines, each with its own dedicated phone line. With PhonePak, I no longer need them, and a single phone line handles calls for all three. Of course, I have to keep my Amiga on all the time, but a screen-blanker protects the monitor.

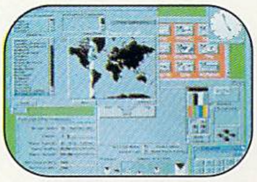
One of the lines handled calls to for the Amiga Video-Graphics Guild, many of which involved only simple requests ►

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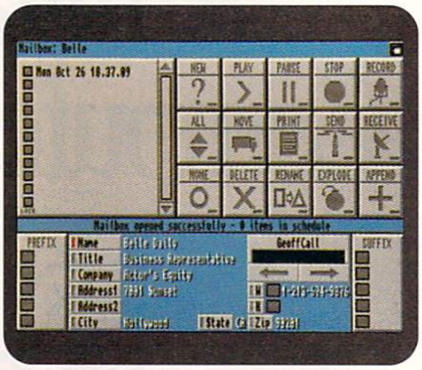
Commodore® AMIGA®

Circle 9 on Reader Service card.

for information and a return call. Thanks to PhonePak, such callers can now hear a recorded message about the AVG, have faxes of the information sent to them, or leave their names and addresses to receive the information by mail. PhonePak eliminated a lot of return calls for me, making it well worth the money.

It also gives me more time to earn money. When I'm on a project deadline, I can't take stop to talk to anyone but my client. With PhonePak, I can give the client a special code number that instructs the program to page me over the speakers connected to the Amiga. I can even make it seem like the call is being transferred, as the person on the other end will hear a simulated phone ringing. If you have Centrex or a compatible system, PhonePak can even route the calls to other phones.

At its most basic, PhonePak is a sophisticated answering machine that records incoming messages as standard Amiga IFF sound files. (Eighteen 30-second messages consume about 10MB of storage space.) What makes it really stand out, however, is its voice-mail capabilities. The voice mail gives the caller choices from a verbal menu. When she calls, a recorded voice tells her to press 1 now on her touch-tone phone if she's calling my production company, 2 if she's calling the AVG, 3 if she's calling my wife's magic company, or 4 or 5 for personal messages for either of us. Friends have special access numbers that page us immediately. All calls are screened; I never hear the phone ringing. If a caller needs to talk to me, the system pages me.



PhonePak VFX automatically monitors, stores, and forwards your voice mail and faxes.

Mail Call

The system is very easy to set up. After you pop in the board and plug in your phone lines, you determine the mailboxes you want. For each mailbox, you set the length of the incoming message and an optional password for access to it. You can also type a script in the transfer box for Centrex transfers or audio paging. The Operator script language, which can be used through ARexx, lets you automate things in very sophisticated ways. The program even lets you specify whether you're in or out, and will not page you if you're away. For each mailbox, you also save a greeting for the software to play upon access. Recording is a breeze. Select the Local Connect menu option, pick up your phone, click on the record button, talk, and then press the stop button.

The next step is to route the boxes in the switchboard. You can set up as many mailboxes and routes as you need. Use the Add Route menu option, enter a number of up to nine digits (a menu choice or extension), then click on the corresponding mailbox. When the caller presses the number, he is routed to the selected mailbox.

PhonePak automatically detects and receives fax-machine calls, and it can

Continued on p. 74.

The New 24-Bit Amiga Graphics Standard





Create title screens combining scanned images, clip art and other elements using OPAL PAINT's wide array of tools and modes.



OpalPaint's image processing modes will alter any area or an entire image. More than a paint program, OpalPaint is a complete creative environment.



OPALPAINT's exclusive real-world Artist's Tools and paper types bring a new level of artistic creativity to the Amiga.

The Reviews Are In. The Experts Agree. OpalVision Sets A New Standard of Excellence.

"Quite simply, it's a spectacular product."
—Amiga Computing Magazine

"Undoubtedly the finest, most professional paint program to arrive on the Amiga."
—Amiga Format Magazine

"OpalVision is awesome!"
—Camcorder Magazine

"Professional quality at this price can't be turned away."
—Amiga User International Magazine

"OpalVision is an amazing delight."
—Hank Tucker, Producer for Disney TV Animation

"The verdict was unanimous —*brilliant.*"
—Amiga Shopper Magazine

"OpalPaint is in my opinion the best paint program currently available in the United States for the Amiga."
—The Amiga-Video Journal (AVID)

The OpalVision Main Board

- A true 24-Bit frame buffer and display device with 16.8 million colors available for every pixel.
- Uncompromised, 24-Bit higher-than-broadcast-quality, crystal-clear images.
- Standard Amiga graphics and animations can appear in front of or behind OpalVision images on a pixel-by-pixel basis.
- Performs double-buffered 24-Bit and 15-Bit animation in medium and low resolution modes and 8-Bit double-buffered animation in all resolutions.
- VLSI graphics coprocessor enables resolution changes, stencil modes, a host of transition effects and smooth scrolling between screens.
- "Palette-Mapped" design updates screen colors in real-time. Fade pictures in and out and change their palettes on the fly.
- Double buffered full 24-Bit, 15-Bit and 8-Bit true color modes, 24-Bit and 8-Bit palette-mapped display modes, Dual Playfield and Overlay Priority stencil modes.
- Priority mask definition specifies foreground/background areas in 24-Bit images.
- Microcode graphics processor for system control, priority switching, hardware scrolling and panning.
- 20ns video switch to freely mix Amiga and OpalVision graphics.
- Expansion connectors for available Framegrabber/Genlock and Scan-Rate Converter hardware modules.
- Expansion socket for the "Roaster Chip," a live video special effects processor.
- Automatically self-configures for NTSC or PAL operation.
- 24-Bit RGB output with video bandwidth >7 MHz. Equipped with 1.5 MB of display RAM.
- An internal card which operates in any Amiga computer with a video slot.

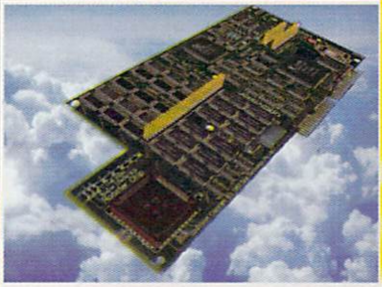
OpalPaint

Everyone is excited about OpalPaint. In fact, nearly everyone who's spent any time using it says it's the finest, most professional paint program on the Amiga. And with good reason. It's Fast. Real-time. Full 24-Bit. OpalPaint gives you complete control over OpalVision's 16.8 million color palette. Includes a full-range of drawing tools and an expandable library of image-processing modes with adjustable parameters, complete texture-mapping capabilities, transparency and color gradients, multiple work modes, nozzle brushes, pre-defined palettes and many other comprehensive tools. Unique and powerful features like real-world "Artist's tools" and paper types, multiple stencil types, virtual memory support and compatibility with the pressure-sensitive Wacom drawing tablet provide a level of support for artistic creativity never before available on the Amiga.

OpalAnimMATE

Our powerful new animation player lets you run OpalVision animations at rates of up to 60 frames per second. It works in 8, 12, 15, 18 and 24-Bit modes and features selectable screen sizes from 32 x 20 to 768 x 286 pixels. Features an easy Workbench interface, dynamic DMA allocation for best frame rates on slower machines and will play animations directly from a hard drive. Our delta compression feature creates small files and fast playback rates. Create 16-million color animations using your favorite 3D rendering package and play them back through OpalVision!

Also included are Opal Presents!, an icon-driven presentation program, OpalVision Hot Key, a powerful and very useful image display utility and the world's first 24-Bit game, King of Karate.



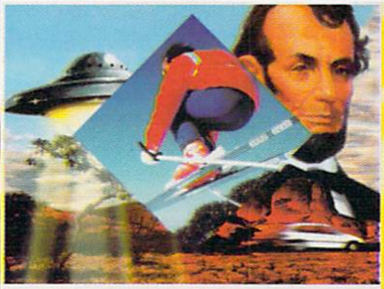
OpalAnimMATE offers real-time playback of animations created by ray-tracers, landscape generators, morphers and all other 24-Bit software.

Amiga Developers Create OpalVision Software

OpalVision displays all standard IFF 24 images and is instantly compatible with virtually all Amiga 24-Bit software. At the same time, all of the important Amiga developers are creating new versions of their programs which directly support OpalVision-specific, advanced features. Here are just some of the titles that are already available or soon to be released:

Activa International - Real 3D
ASDG - Art Department Professional and Morph Plus
Adspec Programming - Aladdin 4D
Black Belt Systems - ImageMaster
SCALA - MultiMedia 200 and InfoChannel
GVP - Image FX and Cine Morph
Octree Software - Caligari 24
RGB Computer & Video - AmiLink Video Editing Products
Amazing Computers - Transporter single frame recording software
Texture City - Texture City 24-Bit image libraries
TecSoft - TV Paint
Progressive Peripherals and Software - 3D Professional

OpalVision also works with the Amiga 4000 and the AGA chipset!



OPAL PRESENTS! includes numerous built-in transitions for image sequencing and presentation. It also triggers CLI and AREXX commands.

The OpalVision Main Board is the core of a complete video system.

Enhancement Modules are on the way which add exceptional graphic and video features to the OpalVision Main Board. Create a complete video production studio by adding some or all of the OpalVision Expansion modules. The modules connect directly to the Main Board without tying up Amiga slots.

Frame Grabber + Genlock Module

24-Bit real-time framegrabbing and better-than-broadcast-quality genlocking with S-Video, RGB and composite inputs and outputs. Real-Time video effects, transitions and color processing.

Quad-input Production Switcher

Complete video switching capabilities. Includes four S-VHS, four composite and one RGB input. Three outputs: Composite, S-Video and RGB. Combine two live video sources, 24-Bit OpalVision and Amiga-generated graphics.

OpalVision Scan-Rate Converter

Perfect for desktop publishing and graphic arts applications. Generates flicker-free 24-Bit and Amiga graphics. Can also be used as a separate 24-Bit frame store for multimedia applications.

OpalVision Roaster Chip

Amazing, complex Digital Video Effects. Real-time processing of live video. "Picture-in-Picture" capability. Includes pre-made effects and provides for the creation of custom effects.



The OpalVision Roaster Chip transforms any video signal in real time. A wide variety of complex DVE's are included, or create your own!

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24-BIT IMAGINE IMAGE, "STUDY," BY BRADLEY W. SCHENCK

DEVICES & Desires

Whether or not you're a fan of P.D. James, you'll appreciate Inspector Leemon's detective work as he unravels the mystery of Amiga display devices. Our comprehensive dossier—with comparative evaluations of 13 graphics boards—should satisfy your every desire for enhanced color resolution.

First and foremost, the Amiga has always been a graphics machine. That's why enhanced-display devices rank high on the "want" list of so many Amiga users. These devices can improve your display output in a couple of different ways. The ones with greater color resolution allow you to display more than the standard 4096 colors on screen at once. The extra colors help to display smoothly-shaded images with photographic clarity, which is great for video and graphics design work. Increased pixel resolution, on the other hand, allows you to work with highly detailed images, and is mostly used for applications like CAD and desktop publishing.

Most Amiga users find increased color resolution to be more important than greater pixel resolution. For one thing, many existing Amiga programs are able to create images with millions of colors, while applications that can take advantage of a 1024X1024 screen are at present almost nonexistent. For another, a high percentage of Amiga owners need to be able to take their display output to videotape, and there just aren't any devices that can output a screen larger than the Amiga's standard 1448X482 SuperHires display (1448X566 PAL) to composite video.

Whether you wish to enhance the color resolution, the pixel resolution, or both, beefing up the Amiga display is no simple matter. The problem, ironically, is the Amiga's own custom display chips. In order to offer maximum performance, the Amiga's operating-system software is inextricably linked to its own proprietary display hardware. This makes the challenge of software compatibility much more difficult than on the PC or Macintosh, where even the standard display hardware comes on a plug-in card that is addressed as an external device. Sim- ►

By Sheldon Leemon

ply put, normal Amiga Workbench applications will not run on any screen other than the native Amiga display (although, as we'll see, some upcoming boards will try to use software trickery to make this happen). Hardware manufacturers, therefore, have been forced to come up with elaborate and ingenious ways to get around this limitation. This, in turn, has caused a lot of confusion about what these boards do and how they do it. Fortunately, when you learn a few of the terms and techniques used, much of the mystery disappears.

The Display Dilemma: 2 Solutions

Most devices adopt one of two general approaches in their efforts to overcome this inherent display limitation and the compatibility problems that go with it. The first is to use the enhanced display as a separate framebuffer with its own separate monitor, unconnected in any way to the normal Amiga display. This is the approach taken by DMI's Resolver and Vivid 24, Impulse's Firecracker 24, Progressive Peripherals' Rambrandt, and ACS' Harlequin (as well as the upcoming Visiona board—to be distributed by MicroPace—and the GVP EGS card). The advantages are that you can control multiple displays with one computer, you aren't limited to the Amiga display resolutions, and you don't tie up the normal system display—which means that these cards can coexist with devices like the Video Toaster. The main disadvantages are the need for a second monitor (or, alternatively, a switchbox) and limited software compatibility.



"The Edge," created by Anthony Kashinn using DCTV

All of these devices can be used as a passive display to show 24-bit images made with programs such as 3-D renderers, using the display software included, or image-processing software (such as ASDG's Art Department Professional and Black Belt System's Imagemaster) that closely supports these devices. If you want to run interactive applications like CAD, 3-D, or desktop-publishing programs on these displays, however, you'll need custom versions designed especially for the board you use, but such programs have been very slow in coming.

To increase compatibility, some manufacturers have tried to modify the system software so that the Amiga Workbench will run on their boards. DMI has delivered a preliminary version of its DMI Workbench program for the Resolver, and it promises a version for the Vivid 24 board that will be compatible with all Amiga applications. The soon-to-be-released Visiona board promises a Workbench emulator program that will run most applications software at resolutions up to 1600x1200. And GVP has already shown the Workbench running on its upcoming EGS-110/24 boards, at sizes of up to 1600x1280.

The second approach to solving the compatibility problem is to connect the enhanced display to the normal Amiga display, so that you can overlay normal Amiga graphics on top of the enhanced display (and, in some cases, vice versa). This method (with some variations) is used by Centaur's OpalVision, GVP's IV24, Digital Creations' DCTV (with RGB option), INOVAtronics' forthcoming AVideo24, and even to some extent by NewTek's Video Toaster. (Optionally, the Firecracker can also be used in this way. You can attach the board to the internal display via an external cable and then use only one monitor for both kinds of display.) These boards display 24-bit output from applications that support it, yet allow you to run normal Amiga applications at lower color resolution on the same monitor.

The drawbacks to this approach are that you are limited to a single display, that the size of this display cannot exceed normal Amiga screen resolutions, and that (with the exception of the Firecracker) you cannot use other cards (such as the Video Toaster) that fit into the video slot. Many of these cards offer only an interlaced display, which makes them suitable for use with a 1084-compatible monitor, but which also means that the screen will flicker in modes more than 300 lines high. Although you can run normal Amiga software on these boards, you will need special software—just as with the secondary displays—to take advantage of their enhanced capabilities.

Before You Buy. . .

When shopping for an advanced Amiga display, you should also consider price, performance, and bundled software. Two 24-bit boards, Rambrandt and Vivid 24, use the TI 34020 chip and optional math coprocessor chips (which make them more powerful computers than your Amiga!). This power comes at a cost, however, as price tags for these boards start at around $3000, and you may not be able to find much software that can take full advantage of their near real-time rendering capabilities.

Moderately-priced ($1000–$1500) boards, such as IV24 and OpalVision, do not provide the same level of performance, but come bundled with a selection of very useful graphics programs, such as paint and presentation applications. Be sure to check the minimum hardware requirements for these boards. They range from a 68000 system with 3MB of RAM to a 68030 with 8MB of RAM. Also, watch for a new super-low-cost external 24-bit device from RCS Management.

Another pertinent issue is animation. Although nobody has yet found a way to animate full-screen 24-bit images at 30 frames per second, several boards claim to support real-time animation at somewhat lesser sizes and color depths. DCTV, though not a true 24-bit device, was the first to offer animation of enhanced-color images. Of the 24-bit boards, only OpalVision currently provides software to compress a series of images into an animation and play them back in real time. But, so far, there is no paint/animation software on the 24-bit front that equals DeluxePaint in the realm of Amiga-made graphics.

While most of these boards share a few basic characteristics, like snowflakes, no two are exactly alike,

which makes comparing them difficult. Not only that, this field of products seems always in a state of flux, as new boards appear (or threaten to appear) and old boards are updated. The following brief, board-by-board rundown should give you a feel for the display enhancers currently available, and for those you may see in the near future.

The boards are presented in two sections, corresponding to the two basic approaches described above. In addition to descriptions of the hardware, you will find information about software bundled with the board and about third-party support for the device.

A third section includes still another category of displays: composite devices. While these are not strictly 24-bit RGB displays, they serve a similar display-enhancement function and are presented for comparison. Finally, we've assembled a chart for side-by-side comparison of the boards currently on the market.

Secondary Display Devices

AS STATED EARLIER, secondary display devices are not tied to the normal Amiga display. This means that it is possible to install more than one of these boards in the same system. Their independence from the Amiga display also makes them more likely to work without modification in the A4000 and future Amiga machines. All require a second monitor (or a multiscan monitor on a switchbox), and those that offer noninterlaced resolutions greater than 1024X768 will probably require an expensive, large-screen multiscan monitor.

Harlequin
ACS / Haitex

Although only recently imported to US shores by Haitex, Harlequin has been available in Europe from its manufacturer, ACS (Amiga Centre Scotland), for quite some time. The Harlequin board plugs into any expansion slot on the A2000 or A3000 (and, according to Haitex, the A4000 as well). Because of a small plug-in board on the side, however, it is so wide that it may preclude use of the adjacent slot.

Four models of the board are available, ranging in price from $2298 to $2898—somewhat high for a board without graphics accelerators or math coprocessors. All models offer 24-bit color at the somewhat unconventional screen resolutions of 740X486, 832X486, and 910X486 (576 lines in PAL). The Model 2000 includes an eight-bit Alpha channel for variable transparency, the 3000 offers double-buffering for animation, and the 4000 provides both. All versions of the board can output graphics either in an interlaced format that can be displayed on a 1084-style monitor, or in a noninterlaced format on an inexpensive VGA or multiscan monitor, such as the Commodore 1960.

The software that comes with the board includes TV Display, a program that displays a 24-bit graphics file and provides some scaling and format-conversion features; and Slide-32, a script-based 24-bit slide-show program with more than 30 transitions. The package also includes a demonstration version of TV Paint, a full-featured 24-bit program by the French company Tecsoft. (This program, first available on the Harlequin, is now also available for most of the boards listed here.)

The demo version of TV Paint lets you paint interactively on the Harlequin screen (as long as you have a minimum of 8MB of RAM), and it contains all of the image-manipulation features of the full program. But you cannot save your images unless you buy the registered version, which comes with a hardware key that plugs into the disk-drive port. TV Paint contains a number of advanced gradient-fill and transparency options, plus numerous drawing modes, such as airbrush, smooth, blur, and smear, and such image-processing functions as convolutions. Finally, the Harlequin comes with a wealth of programming information and libraries that allow users to create original software that takes advantage of all of the board's capabilities.

Among the third-party software that directly supports the Harlequin board are ADPro, Imagemaster, Caligari Broadcast (Octree Corp.), and Real3D (Activa/Programs Plus & Video). Although I have yet to see any animation on the Harlequin, ACS says that Anim24, a program that creates 24-bit real-time animations at partial-screen sizes, should be available soon. Although Harlequin includes connectors for genlocking external video and for overlaying 24-bit graphics onto live video, connecting the board to existing video hardware will take some expertise on your part, as there is no simple "plug-and-play" solution that uses standard Amiga genlocks.



Technical Illustration "Gears," created by Bradley N. Litwin using Caligari

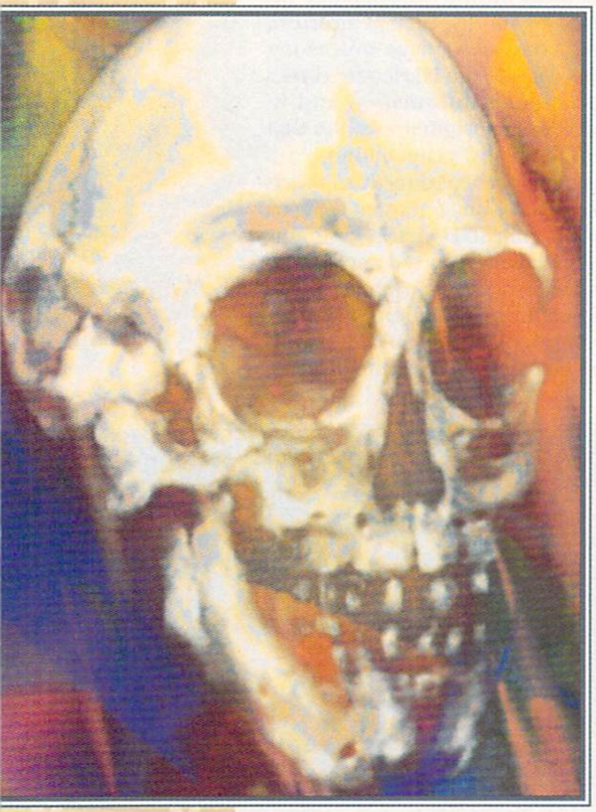
Resolver and Vivid 24
DMI

Digital Micronics has a couple of enhanced-display boards based on the Texas Instruments 340x0 series of graphics processors. These processors offer graphics acceleration plus enhanced resolutions. DMI's 34010-based Resolver displays 256 colors in resolutions up to 1280X1024 noninterlaced and 2048X2048 interlaced (on the proper monitor). The latest, Vivid 24, is based on the more powerful 34020 chip, and displays the same resolutions in 24-bit color (16.7 million colors).

While the Resolver starts at under $1300, the base price of Vivid 24 is $2995, and a fully-equipped model could run more than $9000. You get considerable graphics power for the money, however. DMI claims that a Vivid 24 board with four math coprocessors can perform 160 million floating-point operations per second, more than twice the performance of a $200,000 Silicon Graphics workstation. That's enough power to render complex 3-D objects in less than a second. While ►

neither provides composite output as a standard feature, Vivid 24 offers an optional genlock/encoder module.

Both the Resolver and Vivid 24 come with a small paint program, a configuration program that easily allows you to create whatever output-resolution mode you wish, and a Workbench emulator program that allows you to run some existing applications software at larger screen resolutions. With Vivid 24, DMI also plans to offer DMI-Render, a 3-D renderer that accepts and loads objects in a number of 3-D formats.



"Skull," Created by Joel Hagen, using DCTV

Third-party support for these boards is facilitated by the SAGE libraries, a software standard set by DMI and Progressive Peripherals, which let software made for any 340X0 board on the Amiga work with any other board. There is already SAGE support in ADPro, Imagemaster, Aladdin 4D (Adspec), and Presentation Master (Oxxi). DMI also indicates that there will be a version of TV Paint for its boards and SAGE versions of several other programs, including Real3D and 3D Professional 2.0 (Progressive Peripherals), as well as such specialized software packages as Surf X (a 3-D modeling and rendering program) and Animator Broadcast (an interactive image-processing program). The real development to watch for, however, is 3-D and image-processing software that can take advantage of Vivid 24's math coprocessors.

Rambrandt and Rambrandt Personal
Progressive Peripherals

The Rambrandt board from Progressive Peripherals is also based on the 34020 chip, but Progressive Peripherals has chosen to go for versatility, rather than the brute floating-point power of Vivid 24. This board features a 40 MHz 34020 with a 34082 math/graphics coprocessor, 8MB of Video RAM, and 8MB of DRAM for programs. In addition to 24-bit displays at programmable resolutions upwards of 1024X1024, this board has both inputs and outputs for composite video. This allows it to do framegrabbing, genlocking, and picture-in-picture effects, as well as real-time video manipulation and image processing.

Although Progressive Peripherals has sold some of these boards, mostly to developers, the official launch was set back by a fire that disrupted Progressive's operations. The company assures that things are back to normal, and it plans to reintroduce the original Rambrandt board at $3995. In addition, there will be a new, lower-priced ($2795) version, Rambrandt Personal, that supports S-VHS output but provides no inputs, although Progressive claims that this board delivers better video quality than the regular one. Both versions come with Progressive's 3D Pro 2.0 software and a battery of utilities. Since Progressive has codeveloped the SAGE libraries with DMI, the third-party support should be the same as for the DMI boards.

A2410
Commodore Business Machines

Commodore's A2410 ($998), also known as the Lowell board (because it was designed at the University of Lowell), is an eight-bit board that (like the DMI Resolver) uses the Texas Instruments 34010 graphics chip. While this board has been available for quite some time, Commodore has offered only half-hearted support for the product. CBM positioned the A2410 mainly as a Unix display, on which you may run X-Windows. The only real AmigaDOS support for the A2410 comes in the form of an Art Department saver that allows you to display eight-bit graphics on the board. Considering that DMI offers Unix and X-Windows support for the Resolver, as well as AmigaDOS support, it seems a better choice unless your interest is mainly in Unix.

Coming Attractions

Although not available in the US at this time, two other boards have generated a lot of interest on this side of the Atlantic. One or both may be ready to ship domestically by the time you read this.

Visiona
MicroPace

Visiona plugs into a normal expansion slot on the A2000, A3000, or A4000, and provides a wide range of programmable resolutions—up to 1024X1024 in 24-bit color and 8192X4096 in monochrome. Its variable output scan rates allow you to use a 1084 monitor in either PAL or NTSC modes, although a second, high-resolution Super-VGA monitor is recommended. The board is based around a custom Inmos processor that runs at speeds of 85–135 MHz, depending upon the model you choose. Suggested prices range from from $2600 for the 85 MHz board with 2MB of VRAM to $5600 for the 135 MHz version with 4MB of VRAM. Visiona has no direct composite-video support, but it does have RGB and sync outputs that can be plugged into a standard video encoder.

Visiona will be packaged with the TV Paint demo and V-Paint24 Jr. Also included is a Workbench emulator program, which is said to let you run most applications software at resolutions up to 1600X1200. Visiona Animator, an animation program, is due out a few months after the board's debut. The full TV Paint version will cost an additional $1495. Third-party support includes display modules for ADPro and Imagemaster, as well as some European CAD software.

EGS-110/24
Great Valley Products

GVP's upcoming EGS-110/24 is unique in that it connects directly to the 32-bit expansion bus on any of the GVP Combo board 68030 or 68040 accelerators for

the Amiga 2000. This allows the processor to read and write the video RAM directly, just like its own 32-bit memory, for very high performance. The output of the board is completely programmable, allowing resolutions of up to 1600X1280 in 24-bit color on appropriate monitors. The 4MB and 8MB versions have suggested prices of $2699 and $3399, respectively. The EGS board has no direct support for composite video, but a composite encoder can be used to convert its RGB video, and the board includes a sync-in connector that allows it to genlock to an external video source.

The software that comes with the EGS will include MacroPaint and a demonstration version of TV Paint. The full version will cost an additional $995. Also bundled with the board will be EGS programming libraries, full programming information, and a Workbench driver that will allow existing Amiga applications to run directly on the EGS board in reso- ►

Feature Comparison: 10 Amiga Display Devices

	Toaster	DCTV	Firecracker 24	IV-24	A2410	Resolver	Vivid 24	Rambrandt	OpalVision	Harlequin
Manufacturer	NewTek	Digital Creations	Impulse	Great Valley	Commodore	Digital Micronics	Digital Micronics	Progressive Peripherals	Centaur	ACS
List Price	$2495	$495 ($595 PAL)	$1000	$1995	$998	$1295–$2195	$2995–$9300	$3995	$995	$2298–2898
Output Type	Comp.	Comp. (1)	RGB	RGB/ Comp.	RGB	RGB	RGB	RGB	RGB	RGB
Horizontal Scan Rate	15 KHz	15 KHz	15 KHz	15/31 KHz	Programmable	Programmable	Programmable	Programmable	15 KHz (3)	15/31 KHz
Genlock Compatible?	Includes	Optional (1)	External	Includes	No	Possibly (5)	Encoder optional	Includes	Optional extra	Possibly (5)
Displays Workbench?	No	No	Yes	Yes	No	Yes, via emulator	Yes, via emulator	No	Yes	No
Amiga Models Supported	2000	All	2000/ 3000	2000/ 3000	2000/ 3000	2000/3000/ 4000	2000/3000/ 4000	2000/3000/ 4000	2000/3000/ 4000	2000/3000/ 4000
Color Resolution	2–4 million	2–4 million	16 million	16 million	256	256	16 million	16 million	16 million	16 million
Max Pixel Resolution	768x480 (int)	768x480 (int)	1024x480 (int)	768x480 (int or non)	1280x1024 (non)	1280x1024 (non) 2048x2048 (int)	1280x1024 (non) 2048x2048 (int)	1024x1024 (int or non)	768x476 (int) (3)	910x486 (int or non)
Multiple Devices?	No	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Video Standard	NTSC	NTSC or PAL	NTSC/ PAL	NTSC/ PAL	NTSC/ PAL	NTSC/ PAL	NTSC/ PAL	NTSC/ PAL	NTSC/ PAL	NTSC or PAL
Toaster Friendly?	NA	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Deinterlacer Friendly?	Partial (2)	Yes	Yes	Includes deinterlacer	Yes	Yes	Yes	Yes	No (3)	Yes
Video Digitizer?	Frame-grabber	Slow-scan	No	Frame-grabber	No	No	No	Frame-grabber	Optional	No (4)

Notes:

(1) Separately available RGB adapter enables use with a genlock.

(2) The Toaster works only with deinterlacers that do not use the video slot.

(3) Does not work with third-party display enhancers, but provides 480-line noninterlaced 31 KHz display with its own optional deinterlacer module.

(4) Although there is no built-in video digitizer, optional TV Paint software supports digitizing with such third-party boards as DKB's imminent V-Lab.

(5) Does not work out of the box with normal Amiga genlocks. With custom cables, it may work with Amiga genlocks or professional video encoders/scan converters.

lutions of up to 1600x1280 in up to 256 colors. And considering GVP's track record, with extensive software support for the IV24, there will probably be other applications available by the time the EGS board is released.

Combination Workbench/Enhanced Devices

THESE DEVICES SUPERIMPOSE their graphics on top of the normal Amiga Workbench screen, allowing you to run normal- and enhanced-mode programs on the same monitor. Some of them take up the video slot, which means that it is not available for devices like the Video Toaster or deinterlacer boards. Their interaction with the system display hardware also makes them more likely to encounter problems with the A4000, particularly in some of the new display modes (although you are less likely to need one of these boards if you have purchased an A4000).

OpalVision
Centaur Development

One of the hottest new Amiga display boards, OpalVision takes a unique modular approach. The basic board, which plugs into the video slot, offers 24-bit color (plus an eight-bit alpha channel) at a resolution of 768x476 interlaced on a standard 1084-style monitor. By early 1993, Centaur plans to offer a video-input module that will add frame-grabbing and overlay-genlock capabilities, a deinterlacer that will let you display noninterlaced screens at VGA scan rates, and a switcher and digital video-effects module that will give you some of the Video Toaster's capabilities. The base unit costs only $995, and even with add-on modules, OpalVision should be quite competitive.

The software bundled with OpalVision includes OpalPresents, a slide-show program, Opal HotKey, a presentation program, and OpalPaint, a full-featured paint program. OpalPaint, in particular, includes such state-of-the art features as tolerance ranges for stencils, fills, and brushes that are not found on any other Amiga paint program, including TV Paint versions that sell for over $1000.

Centaur has enhanced this program considerably since its initial release, adding image-processing functions and full ARexx support. In its recent 1.1 release, Centaur also added Opal AnimMATE, an animation-creation and playback system that is the first of its kind for an enhanced Amiga display. Such animations take up an enormous amount of space and processor power, but AnimMATE can play a sequence of 320x200 lo-res 12-bit color images at up to 20 frames per second or 24-bit images at up to 15 frames per second on an Amiga 3000. (For a more detailed look at the capabilities of the new OpalVision 1.1, see the review on p. 77.)

Third-party software support for OpalVision has been outstanding. An impressive number of leading Amiga graphics packages, including ADPro, MorphPlus (ASDG), Imagemaster, Aladdin 4D, Scala (Scala Inc.), Caligari Broadcast, Desktop Darkroom (GVP), TV Paint, 3D Pro, and Real3D, all support this board.

Firecracker 24
Impulse

Available for $1000 or less, Impulse's Firecracker 24 remains the basic, no-frills workhorse for 24-bit display on the Amiga. Although it plugs into a normal expansion slot, by connecting the output of the Amiga video port to the board via an external cable, you can turn it into a combined display in which the Workbench is superimposed on top of the 24-bit images. Its output of up to 16.7 million colors at resolutions of up to 1024x480 interlaced comes out of a normal 23-pin Amiga video connector. This means that you can use not only your regular 1084 monitor with the board, but also your normal external genlock.

Firecracker 24 comes with display software, as well as Light24, a middle-of-the-road paint package that, unfortunately, has not been updated in quite some time. Impulse's Imagine 3-D program (available separately, although some retailers bundle the two products) naturally supports the Firecracker. Third-party software support includes ADPro and Imagemaster (a special Firecracker version of the latter allows you to paint right on the Firecracker board).

IV24
Great Valley Products

Versatility is the strong point of GVP's ImpactVision 24 ($1995). This unique board is the only one designed so far to take advantage of the special combination video slot found on the A3000, although the board also works fine on the A2000, where it plugs into the video slot and connects to a normal expansion slot via a ribbon-cable adapter. Current versions of the board do not work on the A4000, but according to GVP new production runs incorporate A4000 compatibility.

As a basic 24-bit display, the IV24 allows you to show as many as 16.7 million colors on a 768x480 screen. Its RGB output can be set to either an interlaced display on a 1084 monitor, or a noninterlaced VGA display. Using the included Video Interface Unit (VIU), the board has both inputs and outputs for composite video. This allows it to genlock and overlay both standard Amiga graphics and 24-bit graphics on top of live video, to capture video frames on the fly, and to display an external video image in a small window on the Workbench screen. The VIU even has connections for two inputs and allows you to switch between them.

The IV24 software includes a control program to activate the board's various modes, a picture-in-picture program, a simple framegrabber, a 24-bit display program, and several applications. Initially, these included cut-down versions of the presentation package Scala and the Caligari 3-D rendering and animation package. By the time you read this, however, GVP will have replaced these with Desktop Darkroom (a full-featured image-capture and -processing program), My Live Action Director (a program for switching between two live video sources using a number of transition effects), and an updated version of MacroPaint 24.

GVP has been very active in its software support for the IV24, and it has demonstrated several turnkey systems for vertical markets based on the board. These include a T-shirt printing system and ADDI, a digital composition system meant to compete with professional video gear that costs ten times as much.

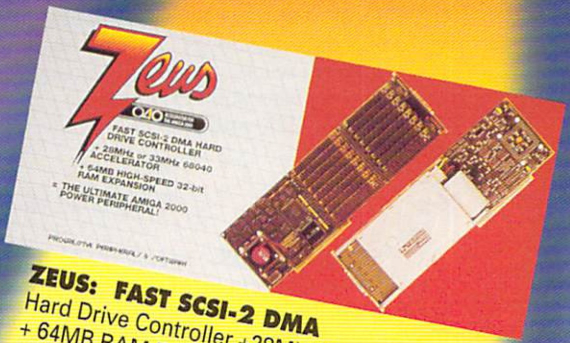
Delayed Releases

In the coming-attractions department for these combination-type boards, we find a pair of boards—both ►

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Circle 150 on Reader Service card.

from the same developer—without a release date, and apparently on hold.

AVideo12/24
INOVAtronics

In mid-1992, INOVAtronics advertised that it would soon begin shipping AVideo12 and AVideo24, low-priced 12- and 24-bit graphics boards that plug into the Denise socket of the A2000 and A3000. (AVideo 12 also works with the A500.) These boards allow normal Workbench graphics to be displayed on top of an enhanced background, using normal monitors and genlocks. Although both boards have been in limited release to developers, INOVAtronics has delayed the general release of these products—perhaps to rethink and reposition them in light of the introduction of the Amiga 4000 and A1200.

Composite Devices

STRICTLY SPEAKING, THE remaining boards do not really belong in the category of 24-bit RGB displays, because they are multifunction devices designed mainly for composite-video input and output. Although composite video presents a somewhat blurry picture with somewhat fewer colors than the 16 million offered by RGB boards, these devices allow you to record their output directly on your VCR. Since they do provide enhanced color from your Amiga, they represent an alternative that should be considered.

The Video Toaster
NewTek

The Video Toaster ($2495) provides so many video-production tools that it is hard to think of it as a display device. Nonetheless, with two broadcast-quality frame-buffers, frame-grabbing capabilities, and a complete paint package, the Toaster does perform many of the same functions as the other boards presented here. Apart from that, of course, it offers all the switching, digital effects, luminance keying, color effects, and 3-D rendering and animation capabilities that truly make it a "TV studio in a box." NewTek, however, makes no pretense that the Toaster is a "multimedia" board of any kind. But if video production is your goal, the Toaster should be the first place you look.

DCTV
Digital Creations

DCTV is an external box that plugs into the RGB port of any Amiga. It may not provide the high-quality output of the Toaster, but at about $500 it is much less expensive. The standard DCTV unit requires a composite monitor, but Digital Creations recently released an RGB adapter for DCTV that allows you to use the RGB mode of your 1084 to display the picture. With the included parallel-port cable connected, DCTV also can digitize a still-video picture in under 10 seconds.

Unlike most display devices, DCTV does not provide its own independent display. Rather, it takes the data from the normal Amiga display and interprets it as compressed analog video data. This means that you cannot display normal Amiga graphics at the same time as DCTV graphics, because DCTV uses up the normal Amiga display. It also means, however, that DCTV images can be stored as normal hi-res Amiga IFF files, about 100,000 bytes, which compares favorably with the 800,000 or more bytes required for a 24-bit image. These DCTV pictures can be displayed by any software that displays a normal IFF picture, including AmigaVision (CBM) and similar presentation packages. They can even be compressed into normal ANIM files for high-color animations that play back in real time.

All of this serves to enhance considerably the already formidable software bundled with DCTV, which includes an image-processing program, the video digitizer, and DCTV Paint, one of the more highly regarded video paint programs for the Amiga. The latest version of ADPro supports the creation of DCTV-compatible IFF images, as well.

Don't Forget the A4000!

If you are considering enhancing your current Amiga display, don't overlook the option of buying an Amiga 4000, or even an A1200, both of which contain the AGA (Advanced Graphics Architecture) chip set, the new standard for built-in graphics. Among the several new display modes are a 1280x480 256-color interlaced mode for video and a 736x480 mode that uses hardware compression to give you 18-bit color (262,000 shades) for only eight bits of data. With its powerful 68040 processor, the A4000 will let you animate full-screen high-color images at 30 frames per second.

Although software support is limited as of this writing (only ADPro and Pro Write 3.3 take direct advantage of the new graphics modes), a whole host of AGA software should soon be available, including updates of existing programs (such as Electronic Arts' DeluxePaint IV) and brand-new ones (such as Brilliance, Digital Creations' paint/animation package). After all, AGA is the standard for all new Amigas.

The Future: Retargettable Graphics

Although the tight link between the graphics chips and the operating system has made it difficult to integrate new displays with the Workbench, that situation won't last forever. In a keynote address at last fall's World of Commodore show, CBM's VP of Engineering, Lewis Eggebrecht, indicated that AmigaDOS 4.0 would incorporate retargettable graphics (RTG). This means that operating-system graphics functions would no longer write directly to the hardware, but instead use an intermediate library of functions. This will enable a display manufacturer to write a simple driver allowing all well-behaved software to use the new display automatically.

Versions 2.0 and 3.0 of the operating system have already laid the groundwork for this system by allowing software to enquire about the characteristics of the display and, for example, to select colors by asking for "the closest available shade of green," rather than specifying a hardware color register. If things go as planned, in the next year or so you may have an even more bewildering array of enhanced-display devices from which to choose! ■

*Sheldon Leemon is a respected authority on the Amiga and author of several books, including **Inside Amiga Graphics**. He recently finished the fourth edition of the **AmigaDOS Reference Guide** (Compute! Books). When he's not writing, you can often find him at Slipped Disk, a Detroit-area Amiga dealership.*

Four Color

For More Color

With the help of a full-color display device, 24-bit graphics look great on your screen. But how do you get that same great look on paper? Let's explore the basics of full-color printing, the tools available, and the people you will work with to see your production finalized.

While there are other techniques available, we will focus on the most common production method, lithographic ("litho") printing. The litho process involves placing a thin layer of ink on a flat printing plate, which is chemically treated to repel ink in the non-printing areas, and then pressing that plate onto paper. The plate is typically created by exposing a film negative of the print image to the plate surface. This negative can be created using traditional methods or from a computer file sent to a high-end laser printer that handles film output. Such printers are commonly available to desktop-computer artists through service bureaus.



"ARTIFICIAL INTELLIGENCE"

PRINT TYPES

To understand 24-bit printing you must understand graphics printing in general. Any production includes type, art, or a combination of the two. The artwork can be either line art (black-and-white), halftone, spot color, or full color. Line art and halftone images are produced with one pass through the press; the ink and the paper combine to create the final image. Although the ink is usually black and the paper white, they may be any combination of colors.

Halftone images are the kind you see in newspapers. Look closely at a newspaper picture and you will see that the shades of gray are created by altering the size and placement of printed dots. Light gray is created with fine dots widely spaced; dark gray is achieved with large dots closely spaced. Traditionally, this pattern is created by placing a fine screen between the original photograph or image and the negative used for creating the print plate. Computer software can also create this screen pattern (line screen) from your original image. The required line screen will vary depending on the final print requirements. For example, magazines use a much finer line screen than do newspapers, which is the reason photographs look better in magazines. ►

How do you get your full-color graphics to look as good on paper as they do on screen? Via the print industry's four-color process.

BY STEVEN BLAIZE

Line screens are cited in terms of lines per inch (or lines per centimeter outside the US). Typical values are 133 to 150 for magazines and 75 for newspapers. Line screens should not be confused with the common computer-printing measurement *dots per inch*. (The difference will become apparent in a moment.)

Color is added to a production with additional printing plates and ink colors in the form of either spot color or full color. Spot color is useful when highlighting areas of special interest. For example, to bring attention to an ad for a big sale, you could print the headline in red ink with the rest of the ad in black. You can specify any number of spot colors in your production, but each one requires an additional printing plate.

Full-color photos and artwork are typically reproduced with a technique called four-color process. The images are broken down into components of cyan (C), yellow (Y), magenta (M), and black (K), which are referred to as CYMK separations. Line screens are also used in production of four-color separations. The size, shape, and placement of the dots affect the final printed image. The dots are overlapped and thus combine into millions of possible colors.

CYMK is simply a method of defining color; any color can be produced by combining specific values of cyan, yellow, and magenta. This method is the exact inverse of RGB (red, green, blue) color combinations your computer monitor uses. For example, 100% each of red, green, and blue gives you white on your screen. But 100% of cyan, yellow, and magenta yields black (actually, it yields a dark, muddy brown; black ink is added to achieve true black). Understanding how colors are represented on screen versus how they print becomes critical when you want your hard copy to look like what you see on your monitor.

Getting What You Want

The term WYSIWYG (What-You-See-Is-What-You-Get) became popular with the growth of desktop publishing. It is applicable to black-and-white images, but not to full color. Why? Quite simply, variations in monitors' brightness and contrast settings alter the screen image. Sure, the colors in your image represent specific values, but how you view them depends on monitor calibrations. Developers for other platforms have produced methods, using hardware and software, for producing reliable output of your screen image. Unfortunately, we are still waiting for this ability for the Amiga.

Variance between screen and print pixels poses more potential trouble. Print dots have a one-to-one aspect ratio, but the Amiga supports many resolutions and pixel aspect ratios. For example, pixels on a 640 by 400 hi-res display have an aspect ratio of six to seven. Also, many multisync monitors let you adjust the display both horizontally and vertically. This means that what appear on your monitor as circles and squares may print as ovals and rectangles. Thus, you should prepare to adjust your graphics using image-processing software before incorporating them in a layout.

Today many programs permit you to create color PostScript files, load full-color 24-bit images, and specify spot-color areas in your designs. The differences among them lie in how they control your printed output. For example, with a graphics program such as Electronic Arts' DeluxePaint IV, you can create any bitmapped graphic image up to 4096 colors—but you can output this image only to an Amiga Preferences printer. If you want to litho print this image, you must use other software to create four-color separations. ASDG's Art Department Professional 2 can load bitmapped images and generate CYMK color separations. And desktop-publishing programs such as Saxon Publisher (Saxon Industries), Professional Page (Gold Disk), and PageStream (Soft-Logik) can handle complete layout with output of four-color or spot-color separations. (See "Separating the DTP Pack," Sep. '91, p. 29, for more on the separation capabilities of these layout programs.)

What are the benefits and drawbacks to using spot-color vs. four-color separations? Spot color provides predictable output: If you specify a color, you can be certain that the final ink will match. Both the Pantone and TruColor systems let you determine exact colors using preprinted swatches (available from graphic-design supply stores). The disadvantage here is that each color requires a different print plate, and each plate requires either another setup and pass through the press, or a more sophisticated, multicolor press. Either option increases the cost of the final production.

To keep costs down, most multicolor productions are done with four-color separations. The problem is that you must depend on the software to correctly analyze and print the correct size, shape, and position of the CYMK dots that will re-create your image. In addition, the printing press must be registered in position correctly or an undesirable moire pattern will appear. The ►

Color Print Checklist

HERE'S A CHECKLIST for producing high-quality color prints given current Amiga technology:

1. Create your images and layouts with the knowledge that you must do some type of color proofing. Remember that what you see on your monitor is not quite what will be printed.

2. Use software that produces the output you require, either spot-color or four-color separations.

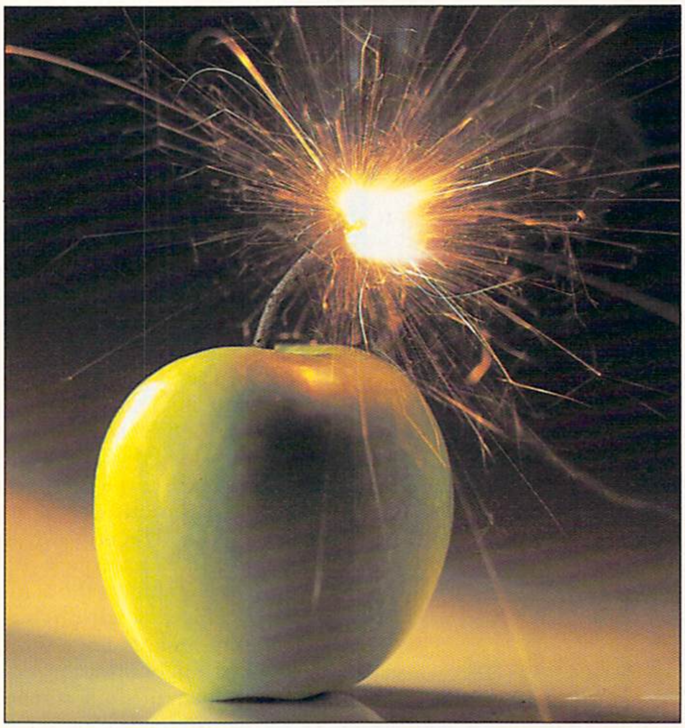
3. Use spot color sparingly, either in work involving fewer than four colors or when a color must be matched exactly.

4. Contact the final printer and find out the type of negatives required (i.e., emulsion side down, right reading, screen line, etc.).

5. Contact the service bureau and find out the file requirements (i.e., source files vs. PostScript-print files, screen line, etc.) and the type of color proofing it offers. Also check on any output warranties, if corrections must be made. —*SB*

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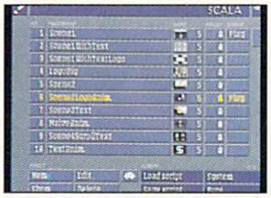
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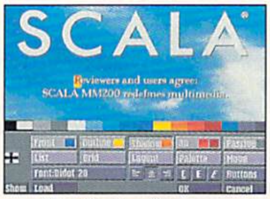
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The Scala main menu.



Scroll text by Scala.



The Scala edit menu.



It's a Scala world!



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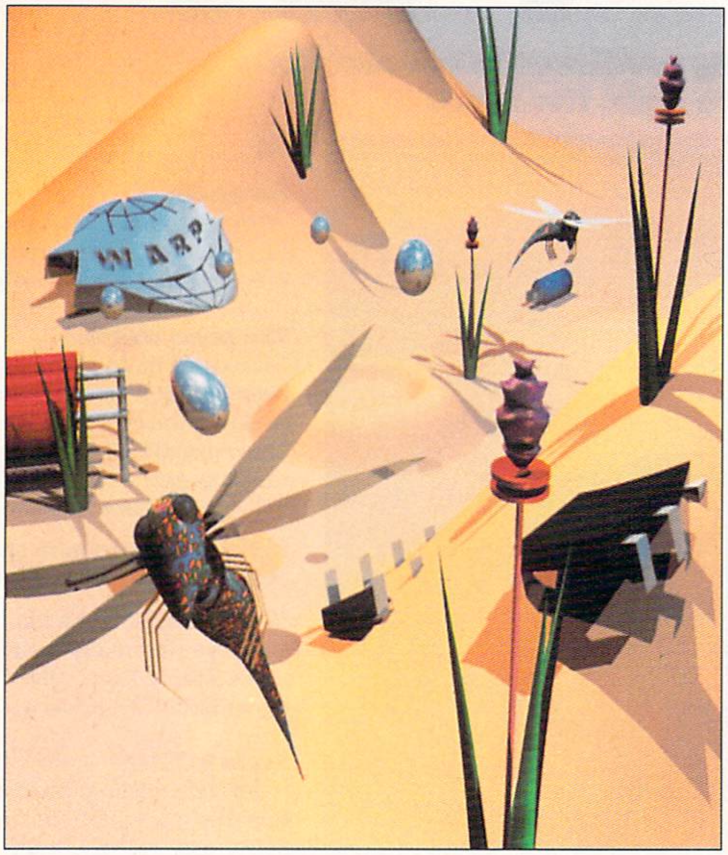
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ability to correctly separate colors and control the separation files is developer dependent. For example, if you want only to print a bitmapped image, ADPro2 works perfectly. You can control the Under Cover Removal (UCR) and Gray Component Replacement (GCR), which helps compensate for the black film and



"EVOLUTION OF THE GROOVE"

the impurities in printer's ink, respectively. This works only for pictures, however. If you have text and graphics, you will need a desktop-publishing program to produce the separation files.

True Color

What do you do with four-color separation files once you have created them? The most cost-effective solution is to output them through a service bureau. You can find service bureaus in most metropolitan yellow pages, and in magazines that specialize in desktop publishing. Most bureaus can handle files either by mail or modem.

Most service bureaus use a PostScript or PostScript-compatible laser printer to generate either paper prints or film negatives. For paper output, you must pay additional costs to produce the required negatives. While it is easy to create the PostScript files (you simply print the separation files to disk), the service bureau will have no control over the output.

Bureaus that handle Amigas prefer that you provide a source file; they load the image into the application and generate the separations for you, and then tweak the separation files to adjust the results. Before choosing a service bureau, ask what type of files it handles, what it can produce, if it can handle source files, and, if not, what settings it needs to produce the output you require. (If the outfit has no experience in dealing with files from Amiga software, look elsewhere.) Settings such as the line screen and the line angle will alter your final output. Often you must get these specifications from the printer who will be handling the output; ad requirements, for instance, are based on the capabilities of the magazine or newspaper in which it will appear.

Generally, service bureaus can also produce a color print if you provide them with a color PostScript file as well as the source file. This may be a good way to check whether the output is close to what you expect. Remember, though, that the output of a full-color file to a color printer is not the same as four-color separations printed on a litho press. After this point, you would use a color key, chromalin, or other form of press proofing to verify color. These methods use the actual four-color negatives to produce a similar output on the final press. The negatives are exposed to a color-sensitive transparency that will produce a specific color; these are then layered on top of each other to produce the facsimile of the final output.

Here the production process comes to a turning point. These color keys are made by your final-press printer, who is using negatives produced by a service bureau. The printer has no control over these negatives, and if they are washed out or have incorrect color values, the fault will be turned back to the negatives. To make corrections, you will have to produce new negatives and new color keys prior to printing your final output. The only way to be completely certain of the output is to request a press proof from your printer, which requires the actual setup and printing of the final piece. While this is generally costly in terms of both time and money, it is the only way to be assured of correct final output.

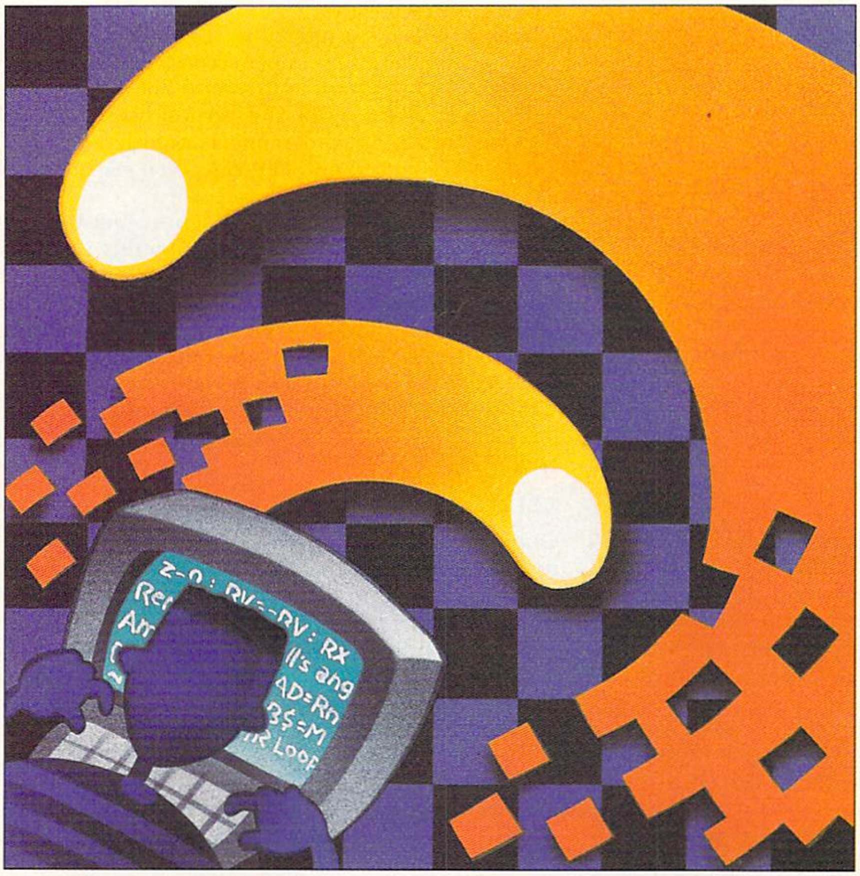
So, in the long run, is it better or more cost-effective to produce color separations by computer than by more traditional methods? While the costs and risks may seem significant, these problems have always existed in full-color printing. Traditionally, images would be scanned and then separated, spot-color areas would be stripped apart by hand, and color correcting and tinting would be done by hand or on expensive, high-end workstations. You now have these controls at your hands on the desktop. Even if you have to reprint color-separated negatives through a service bureau, it will cost far less than having new separations or touch-up work done traditionally.

Full-color processing for print is still evolving on the desktop. While it is considerably better than even one year ago, it is not foolproof. So consider your requirements, software, service bureaus, and your final printer carefully. Find out what each party can do for you, and do not hesitate to ask each of them which part of the process they will take full responsibility for. Most vendors will tell you how well their product works; the question is how well it will work with the other pieces in your production. ■

Steven Blaize is owner of Creative Fire, a multimedia-presentation company, and co-owner of Texture City, developer of full-color backgrounds and textures. He is an author, lecturer, and consultant on Amiga and DOS/Windows platforms specializing in graphic design and 3-D animation.

THE Language OF Motion

If you want to put some zip into the games or other graphics you create, AMOS's special animation sublanguage, AMAL, can deliver smooth motion at blistering speeds.



WHEN I FIRST got Microsoft AmigaBasic for my Amiga, I couldn't wait to try out the sprite and BOB commands that looked so promising in the documentation. What luck! There was even a sample program on the disk. I booted it up, sat back, and...uh, wait a minute, isn't this supposed to be the world's most powerful graphics PC? Those sprites didn't dart across the screen, they trudged.

Later, other BASICs entered the market, but the story was always the same. Trudge, trudge, trudge. I thought I'd died and gone to Siberia...and I began to doubt my Amiga. ►

BY MARK JORDAN

ILLUSTRATED BY DAVID JOLY

Now I must apologize. It took a piece of software from England written by a Frenchman to reaffirm my faith in the American computer with the vaguely Spanish-sounding name.

The program is AMOS ($110, Europress Software—see "Manufacturers'/Distributors' Addresses" on p. 114). It's a BASIC language for all the world to speak (even in Siberia!), with more than 500 powerful, creative commands. And not only does AMOS have this huge vocabulary, it has AMAL. What's AMAL?

- an acronym for AMos Animation Language
- a BASIC/machine language hybrid that sends sprites gliding, BOBs bobbing, and entire screens moving to and fro with silky smoothness
- a fast, powerful, and slightly hard-to-learn doorway to interrupt-driven programming

Let's start with a quick overview of the AMAL concept and then take a look at some real-life AMAL programming in action.

Strings, Grammar, and Channels

AMAL is a sublanguage within AMOS with its own set of 14 commands and 15 functions. None of these, however, can be used directly from BASIC. So how do you access them? Via strings, as in:

```
M$="Let Y=Y+1"
```

You must write your entire AMAL subprograms inside of BASIC string variables, which takes some getting used to.

If your program becomes very long, you'll need to add strings together, like so:

```
M$=M$+"Let X=X+1"
```

For debugging purposes, it's a good idea to use global string variables so that you can print out the entire AMAL program in direct mode to study.

It doesn't take much perusing through the AMAL section of the AMOS manual to see that AMAL has, shall we say, a peculiar syntax. The most important deviations from BASIC you will have to deal with are:

1. Only single capital letters have meaning to AMAL.

2. Semicolons, not colons, are used as command separators.

3. Colons are used to designate labels.

4. If has no Then, just a Jump.

5. For/Next loops use registers, not variables.

Channels are another important AMAL concept. Channels are to AMAL programs what file numbers are to disk files. Once you've assigned a channel to a particular object (say, channel 1 to sprite 8), all AMAL operations under that channel will apply to that object alone. AMAL allows up to 64 different channels, which means you can have up to 64 sprites, BOBs, and screens moving around simultaneously. Or, you can dedicate more than one channel to a single object. For instance, you might want to assign two channels to the same object—one to move the object and the other to perform a "gravitational" pull on it. Since AMAL programs continue until you stop them, a single call to the gravity channel would work throughout the program. There's some real potential here.

Interrupts

Interrupts are a part of any computer's operating system: Every 60th of a second the CPU drops whatever it is doing and jumps into a special program that does chores (such as reading the keyboard) most of us aren't even aware of. Once finished, it goes back to its main business, the program at hand. Here's an oversimplified sequence of events:

Step 1: Signal from timer: It's time for an interrupt.

Step 2: Stop main program, jump into interrupt.

Step 3: Do interrupt routine.

Step 4: Go back to main program.

Machine language programmers love these interrupts because they can sneak their own private routines into the machine's interrupts, thus giving their programs a form of multitasking. While machine language used to be the only route into interrupt programming, with AMOS, interrupts can now be used in the music commands (that's how you can have music playing while the program continues), timer, menus, and several other areas. That's nice, but these are predefined interrupt chores. AMAL, however, lets you write the routine itself where it wedges nicely somewhere in the middle of step 3 above.

Closely related to interrupts are screen refreshes, which also occur 60 times per second. AMAL can coordinate your program to the period between screen refreshes (called the VBL, for vertical blank period). This gives the BASIC programmer as much power over object movements as any language, even machine language—but more on that later.

Once AMOS programmers begin to get used to AMAL, they will find themselves wondering when it's best to use AMAL to move objects and when to simply do it in AMOS. The answer is: When it works fine in plain AMOS, do it; otherwise, use AMAL. If you don't have the AMOS compiler, you will probably choose AMAL most of the time. AMAL is capable of creating virtually an entire game, with the main program's only tasks being to start the action, keep the score, and announce the winner.

AMAL in Action

Once you understand the main AMAL concepts, the next step is to learn the AMAL commands. Although the set is small and the manual explains each command fairly well, getting a handle on them isn't so easy.

Rather than rehash the manual, we can learn more about these commands by creating a sample AMAL program that reads the joystick and then moves a sprite accordingly. This routine is part of a simple game I created, a variation of good ol' Pong, which is included here as Listing 1. I present it primarily for edification, but don't let that stop you from typing it in and playing it. It's fun.

We'll use sprite 9 as the one we will move (i.e., the ►

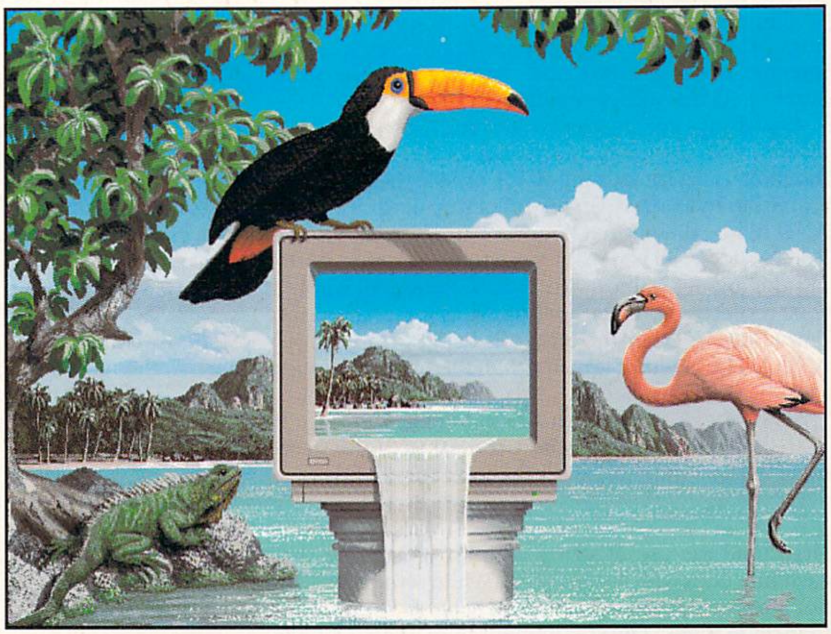
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paddle). Let's start by creating the AMAL string:

```
M$="Loop: If J1&1=1 Jump Up;"
```

Like most AMAL programs, this one starts with a label, in this case the word "Loop." The reason for this is that AMAL programs, for the most part, are loops, and a label is AMAL's only way to identify jump points. The only letter that really matters here is the L. The rest, all lowercase, are simply reminders of what this label does. When writing AMAL subprograms, you must remember not to use two labels starting with the same letter or AMAL will get confused.

Now things get cryptic: What's this "J1&1" business inside an If statement? J1 is one of AMAL's built-in functions, and it reads joystick 1. As for the "&1," the ampersand (&) is AMAL's way of performing a Boolean AND. While there is not enough space here to explain Boolean logic, all you really need to know is this: ANDing the joystick values with 1, 2, 4, 8, and 16 will tell you, respectively, if the joystick is being pushed up, down, left, right, or the button is being pressed. If J1 AND 1 (J1&1) is true (greater than 0), then the joystick must be being pushed upwards.

Now we can see what this If statement is doing. If J1&1 is true, we jump to the Up routine. If the statement is false, then we fall to the next command:

```
M$=M$+"If J1&2=0 J L;"
```

First, note the use of string addition. Also note that each line ends with a semicolon. While semicolons are not always required as command separators, it's safer to include them. The If statement here looks a lot like the previous one, the only differences being that (1) it tests for down pushes (via &2) and (2) it works in reverse, jumping on the condition the joystick is *not* being pushed down. By the way, notice that I have dropped the lowercase reminders on the Jump Loop command so that it simply reads, "J L." It works the same, saves some typing, and after you use AMAL for a while, it will make perfect logical sense.

Okay, so if we fall through, the joystick must be pressed down. Now what? Try this:

```
M$=M$+"If Y>228 J L; Let Y=Y+1; J L;"
```

Things look fairly logical—just another If/Jump—except for the "Y." It, as well as X and A, are reserved registers (variables) inside each AMAL channel that report the Y (vertical) coordinate, X (horizontal) coordinate, and sprite image number, respectively. Since this paddle routine will be channeled to sprite 9, the value in Y will always be the Y coordinate of that sprite. If this Y value is greater than 228, we will be at the bottom of the screen, in which case we'll do nothing and jump back to the beginning. If it is not, we'll increase the value of Y using the Let command. Then we jump back to the beginning.

Want to make your paddle move faster? Just add 2 (or more) to Y. Want to make your paddle move slower? Just place a Pause command at the beginning of your loop, like this:

```
M$="Loop: Pause ; If J1&1 Jump Up;"
```

Pause halts the AMAL routine until the next vertical blank (VBL), in effect coordinating AMAL programs with the screen refreshes. This means that your AMAL program will do only a single loop each interrupt, which is not a bad idea because it speeds up your main AMOS program without any loss at all of animation/movement smoothness. In fact, you can use Pause and *increase* object speed just by upping the pixel increments without any loss of resolution (for example, Let Y=Y+3).

Another way to achieve the same thing is to include a For/Next loop at the same spot, as in:

```
M$="Loop: For R0=1 To 5 ; Next R0 ..."
```

The For/Next option is very flexible because of the way AMAL deals with For/Next loops: It performs only a single count per interrupt. In other words, it provides a built-in Pause at each count. The line above would slow your paddle down by a factor of five.

As you might expect, the Up routine (for when the joystick is pushed north) is pretty much the same as the Down routine:

```
M$=M$+"Up:If Y<52 J L; Let Y=Y-1; J L;"
```

Here we reduce Y if it is greater than 52 and then jump back to the loop to start all over again.

Our AMAL routine itself has now been written. The only thing left to do is to turn this AMAL subprogram on. Once it's on, you can forget about checking joysticks in BASIC because AMAL will keep on working even after the program ends. Simply enter:

```
AMAL 9,M$ : AMAL On 9
```

AMAL can create virtually an entire game, with the main program's only tasks being to start the action, keep score, and announce the winner.

I have no more space to detail the program, but I have left some remarks in the complete listing for further study. I encourage interested readers to pay special attention to the MOVEBALL procedure, which demonstrates how to use AMOS' sprite-moving capabilities in tandem with AMAL's. The result is a ball that bounces at varying angles and speeds.

One article does not provide enough space to probe very deeply into AMAL—and just think, AMAL represents only about 5% of the whole AMOS package. The recent release of "American AMOS" (see Dec. '92, p. 20, for a review) should make this marvelous language accessible to more users on this side of The Pond. Europress has also begun marketing an even more powerful version, AMOS Professional, but plans for American distribution are not yet clear. While the fact that Europress is located in the UK may cause some inconvenience, there is good news for users seeking support. There is an American resource center for AMOS that you can write to, call, or contact through your modem: David Lazarek, Digital Production Labs, 516 E. 11th St., Michigan City, IN 46360-3616; 219/874-6380; Computer People BBS: 219/874-0367. Also, an AMOS ►

All photographs are of actual DCTV screens.

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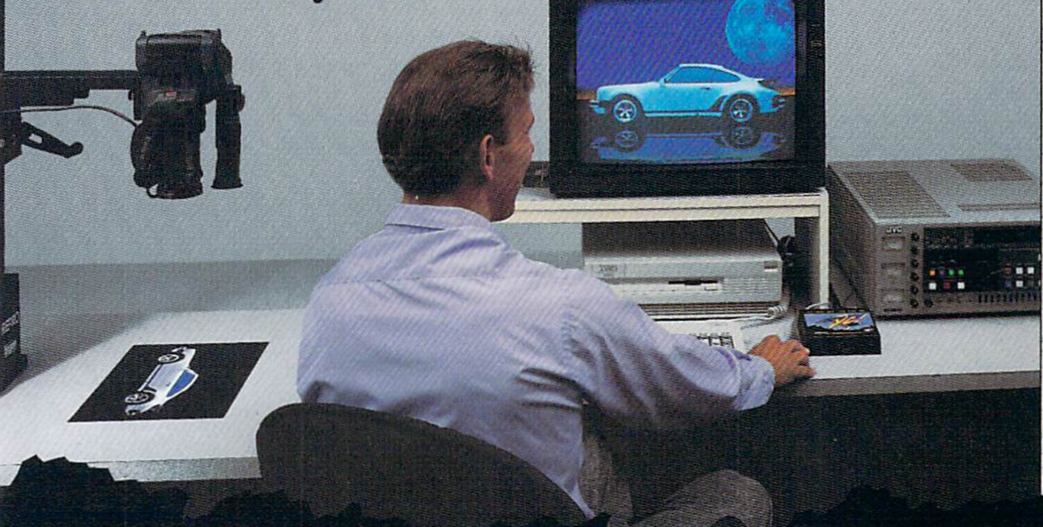
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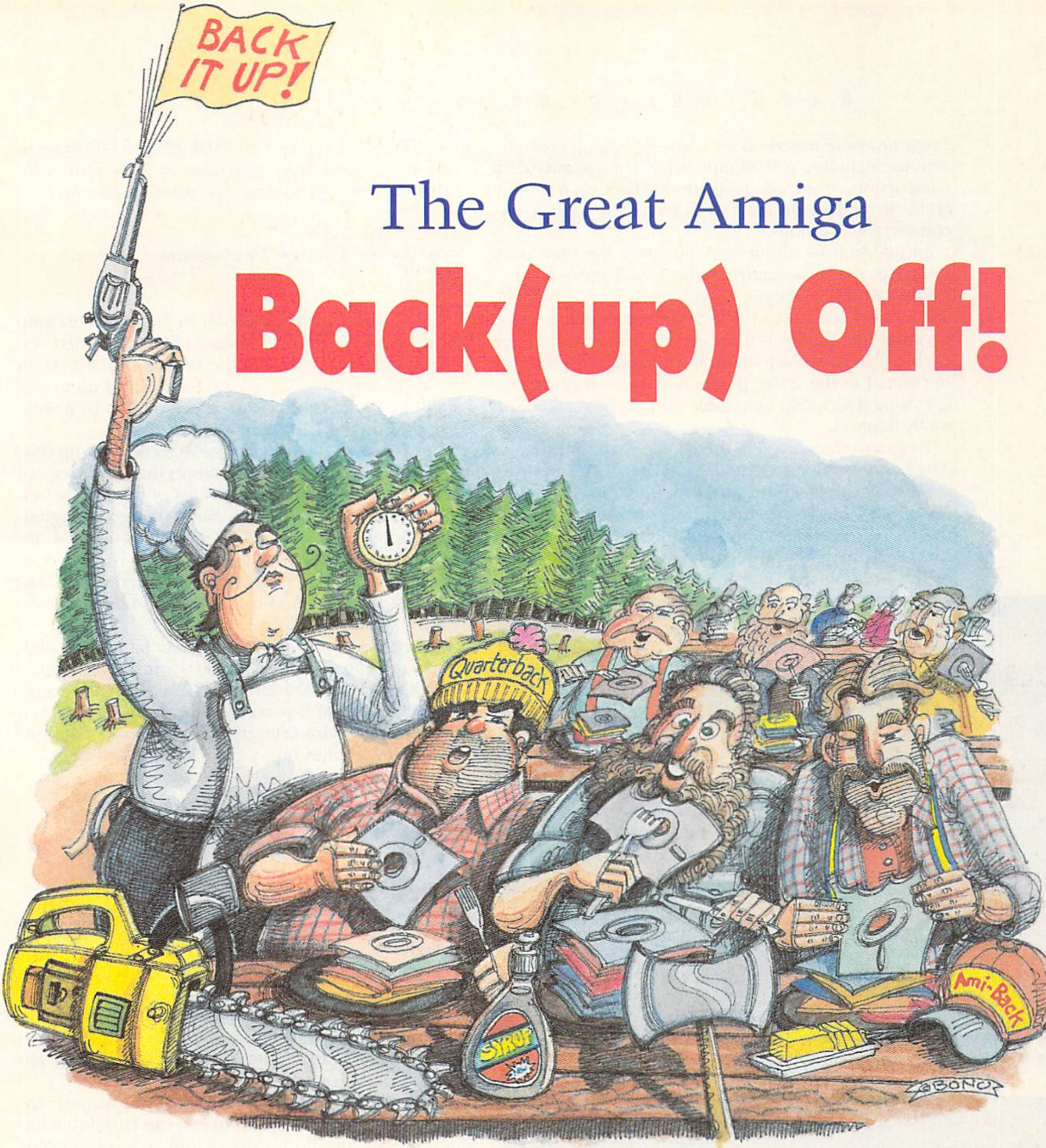
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Listing 1.

```
Dim SCORE(2)
Global N$,S1$,S2$,OFF,GAMEOVER,SCORE(),LEVEL
Do
      SETUP
      MOVEPADDLE
      '
      Repeat
            STRTPOINT
            MOVEBALL
            SCORE
      Until GAMEOVER
Loop
'
'
Procedure SETUP
      SX=0 : S1=0 : S2=0 : GAMEOVER=0
 Rem create ball sprite
      Screen Open 0,320,200,32,Lowres
      Curs Off : Cls 0 : Hide
      Ink 14 : Circle 9,9,5 : Paint 10,10
      Get Sprite 1,0,0 To 15,15
 Rem create paddle sprite
      Cls 0 : Ink 15 : Box 0,0 To 6,20 : Paint 1,1
      Get Sprite 2,0,0 To 15,20
 Rem select level, players
      Cls 0 : Centre "Choose level: 1 (hard) - 5 (easy)" :
Print
      Repeat : A$=Inkey$ : Until A$<>""
      LEVEL=Val(A$) : If LEVEL>5 Then LEVEL=5
      Centre "1 or 2 players?"
      Repeat : A$=Inkey$ : Until A$<>""
      TWO=Val(A$) : If TWO>2 Then TWO=1
 Rem draw Pong box
      Cls 0 : Ink 4 : Box 0,0 To 319,199
 Rem set sprites for collision detection
      Make Mask : Hot Spot 1,$11
      Sprite 9,128,130,2 : Sprite 10,441,130,2
      SCORE(1)=0 : SCORE(2)=0
End Proc
'
Procedure STRTPOINT
      Sprite 8,283,0,1 : Amal Off 10
 Rem drop ball to start point
      Amal 8,"M 0,241,73 ; Let RA=Y" : Amal On 8
 Rem wait till it stops moving
      While Chanmv(8) : Wend
 Rem turn on computer's paddle
      Amal 10,N$ : Amal On 10
End Proc
'
Procedure MOVEBALL
      OFF=0 : RV=-1 : If Rnd(1) Then RV=-RV
      Do
      Rem RV will decide which way ball should travel,
      RX which angle
      Z=0 : RV=-RV : RX=360*RV : Amreg(3)=RV
Rem SP is speed of ball, AD affects ball's angle
      Y=Y Sprite(8) : SP=Rnd(40)+60 : AD=Rnd(5)+1
Rem prepare Amal Move command for horizontal move
at SP speed
      B$="M"+Str$(RX)+",0,"+Str$(SP)
      Amal 8,B$ : Amal On 8
Rem start ball travel loop
      Repeat :
            Rem check if ball past either paddle
            If Y<54 Then Y=54 : AD=-AD
            If Y>241 Then Y=241 : AD=-AD
  Rem change ball's Y placement directly from Amos,
not Amal
      Add Y,AD : Inc Z
  Rem but wait till vertical blank to move it
      Wait Vbl : Sprite 8,,Y,
  Rem set Amal register 0 (RA) with ball's Y value
      Amreg(0)=Y Sprite(8)-10
  Rem if ball past either paddle exit both loops
      SX=X Sprite(8)
      If SX<122 Then OFF=2 : Exit 2
      If SX>452 Then OFF=1 : Exit 2
  Rem other way out is if ball collides with a paddle
      Until Sprite Col(8) and Z>5
      Amal Off 8
  Loop
End Proc
'
Procedure MOVEPADDLE
      Rem paddle routine is explained in article
      M$="Loop: If J1&1 Jump Up;"
      M$=M$+"If J1&2=0 J L;"
      M$=M$+"If Y>228 J L; Let Y=Y+1; J L;"
      M$=M$+"Up:If Y<52 J L; Let Y=Y-1; J L;"
      Amal 9,M$ : Amal On 9
      '
 Rem if two-player game, convert all J1's to J0's (other
joystick)
      If TWO=2
      N$=M$ : Do : P=Instr(N$,"J1")+1 : Exit If P=1 :
Mid$(N$,P)="0" : Loop
      Rem if one-player
       Else
            Rem Find difference between ball's Y (RA)
      and paddle's (Y)
            N$=N$+"Loop: Let R1=RA-Y ;"
            Rem Insert diff as Y distance in Move com
      mand
            Rem and at speed selected by LEVEL
            N$=N$+"M 0,R1,"+Str$(LEVEL+2)+";J L "
  End If
End Proc
'
Procedure SCORE
      SCORE(OFF)=SCORE(OFF)+1
      Pen 5 : Paper 0
      Locate 7,1 : Print SCORE(1)
      Locate 30,1 : Print SCORE(2)
      If SCORE(OFF)>19
            Locate 6+(OFF-1)*23,2 : Pen 3 : Print "Win
ner!"
            GAMEOVER=1 : Wait 240
  End If
End Proc
```

users' group exists in the UK: The AMOS Club, 1 Lower Moor, Whiddon Valley, Barnstaple, N. Devon, EX32 8NW, UK. ■

*Mark Jordan is a high school English teacher and longstanding writer on computer programming. Write to him c/o **AmigaWorld**, Editorial Dept., 80 Elm St., Peterborough, NH 03458.*



The Great Amiga Back(up) Off!

Get out the maple syrup and butter—we've rounded up seven disk-devouring hard-drive back-up utilities for an all-out speed/features competition. Bring on those "flopjacks," Gertie!

FOR MANY AMIGA owners, backing up a hard drive can bring on a stomach ache mighty fast. No one wants to spend an afternoon feeding piles of diskettes into an insatiable back-up program. How do you spell r-e-l-i-e-f? Look for a fast, well-designed back-up program with lots of neat features.

Fortunately, Amiga owners can choose from a broad selection of products offering a wide range of prices, performance, and feature sets. You can pay from $25 to $80 for a back-up program. You can find fast and slow operators, and support for just floppies or for a range of back-up devices. And that's just the beginning. What this means, unfortunately, is that finding the back-up program that best matches your needs can be a challenging task at best.

To help you in your search, we've organized a buyer's guide offering comparative evaluations of seven leading commercial Amiga hard-drive back-up utilities. ►

By Jeff James

ILLUSTRATION BY PETER BONO

Programs were tested on a variety of back-up configurations, including a SCSI tape drive. For a standard of comparison, we included a shareware back-up program (Felix R. Jeske's BackUP v3.5) to match against the commercial offerings.

In addition to rating back-up times for each program (see the accompanying graphs in Figures 1–3 for results), we also prepared a comprehensive comparison of the many other features and capabilities of these seven programs. Tables 1–6 present the major features of each program for side-by-side comparison. Although not stated in the chart, please note that all programs are AmigaDOS 2.0 compatible and support standard 880K floppies.

Programs were timed in three different back-up tests. The first involved backing up 5.3MB (5,322,140 bytes in 537 files) of data from hard drive to floppy disks with the utilities' file-verification option turned off (see Figure 1). The second test was the same as the first, except that verification was turned on (Figure 2). Finally, three of the programs were tested with a SCSI streaming-tape drive, backing up a 29.6MB (29,608,594 bytes in 1438 files) hard-drive partition to New Horizons' Touchdown 100 streaming-tape drive (Figure 3).

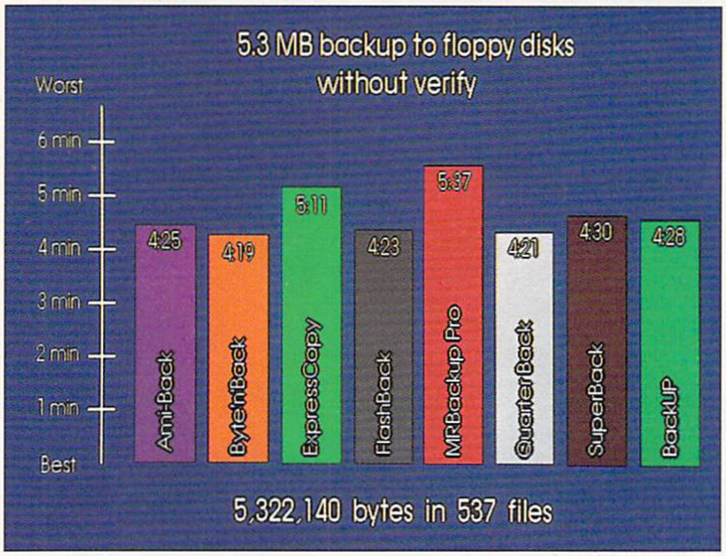


Figure 1. Floppy back-up times (verification off).

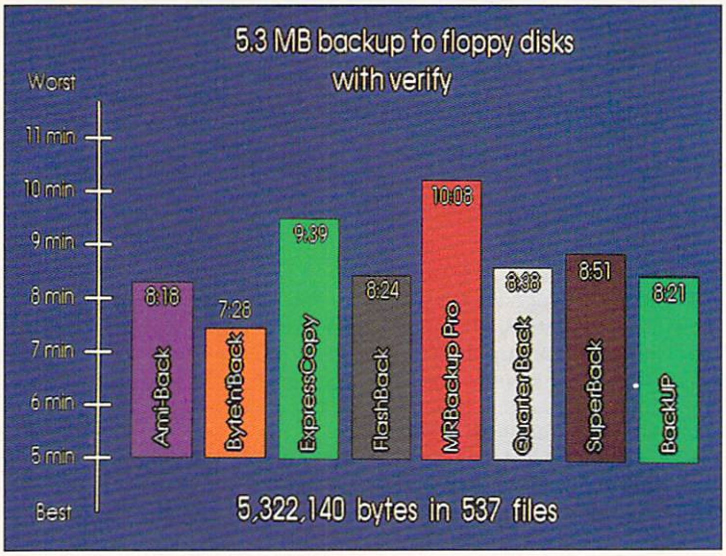


Figure 2. Floppy back-up times (verification on).

Ami-Back 2.0e
Moonlighter Software Development
$79.95

Although a relative newcomer to the Amiga back-up software scene, Ami-Back behaves like a seasoned veteran. It landed squarely in the middle of the pack in the nonverified floppy back-up test, moved up to second place in the verified test, and took first by a mere second in the streaming-tape benchmark.

Ami-Back's solid performance in those back-up tests is bolstered by an impressive features list. Ami-Back can back up and restore to a lengthy list of devices, including removable hard-disk, streaming-tape, and digital-audio-tape (DAT) drives. Other features abound, including support for Commodore's new AmigaGuide on-line help system, a "911-recovery" mode that can grab data from crashed hard disks, and a slick, icon-driven back-up scheduler.

Ami-Back is not completely without faults; although improved from earlier revisions, the instruction manual still needs some revamping. Ami-Back also ranks in a tie as the most expensive Amiga back-up program on the market. However, if you're serious about your hard-drive backups, take a close look at Ami-Back.

Byte'n'Back 3.1.1
Spirit Technology
$29.95

If speed were king, Byte'n'Back would rule over the back-up pack. Although Byte'n'Back narrowly came out on top in the nonverified floppy backup, it rocketed through the second test nearly a full minute ahead of its closest competitor. Developed in the UK by the programming house Bytes n' Pieces, Byte'n'Back sports a packaging claim that "blitter chip and disk hardware [are] used directly for optimum performance." Whatever the reason, Byte'n'Back was the fastest program tested in both floppy categories.

Unfortunately, this speed is offset by an almost embarrassingly small list of features. It can handle a maximum of only two floppy drives and lacks support for tape drives, removable cartridges, and other mass-storage media. The included 18-page manual looks as if it was hastily run off on a photocopier. Regarding the format in which the program saves data, inserting a Byte'n'Back-format back-up disk into any standard Amiga floppy drive caused the shareware program VirusChecker v6.15 to flag each of Byte'n'Back's back-up disks as having boot-block trouble. Such problems aside, if you just need support for floppy drives and speed is your only consideration, give Byte'n'Back a look.

ExpressCopy 1.56
Express-Way Software
$49.95

Developed in 1990 and distributed by Express-Way Software, ExpressCopy is beginning to show its age. Comprising two separate programs (ExpressCopy and ►

Back-up Utilities:

Features and Options

Product Information								
Program	Ami-Back 2.0e	Byte 'n' Back 3.1.1	ExpressCopy 1.56	FlashBack v2.05	MRBackup Pro. 1.12	QuarterBack 5.0.2	SuperBack 2.0	BackUP v3.5
Publisher	Moonlighter Software	Spirit Technology	Express-Way Software	Avanced Storage Systems	MR Software	Central Coast New Horizons	The Disc Company	Felix R. Jeske
List Price	$79.95	$29.95	$49.95	$79.00	$25 (Direct)	$75.00	$39.95	$15 shareware fee
Table 1: System Requirements								
RAM required	1 MB	512K	1 MB	1 MB	1 MB	1 MB	512K	1 MB
AmigaDOS 2.0 interface	●	○	○	◑	◑	●	○	◑
Ease of installation	Excellent	Good	Fair	Good	Fair	Excellent	Good	Good
Table 2: Backup Features								
Format of Backup Disks								
AmigaDOS	○	○	●	○	●	○	○	○
Proprietary	●	●	○	●	●	●	●	●
Data compression	●	●	○	○	●	●	○	●
Adjustable data compression	○	○	○	○	●	●	○	○
Target Devices								
AmigaDOS file	●	○	○	●	●	●	○	○
Max # of 880K drives supported	4	2	4	2	4	4	4	4
Applied Engineering AEHD	*	○	*	*	○	*	○	○
Removable hard drives	●	○	○	●	●	●	○	○
SCSI tape drive	●	○	○	◑	●	●	○	○
Backup Types								
Full backup	●	●	●	●	●	●	●	●
Image backup (AMAX/MS-DOS)	●	○	○	●	○	●	○	○
Recovery backup	●	○	○	○	○	○	○	○
Backs up w/archive bit set	●	●	●	●	●	●	●	●
Backs up after specified date	●	○	●	●	●	●	○	○
Backs up within data range	●	○	○	●	○	●	○	○
Backs up by directory	●	●	●	●	●	●	●	●
Backs up by wildcard/filename	●	●	●	●	●	●	○	●
Duplicates disks during backup	○	○	●	○	○	○	○	○
Table 3: Restore Features								
Restores to a different directory	●	●	●	●	●	●	●	●
Restores to a different drive	●	●	●	●	●	●	●	●
Restore to multiple devices	●	○	○	○	○	○	○	○
Prompts before overwriting files	●	●	●	●	●	●	●	●
Selective file restore	●	○	●	●	●	●	●	●
Table 4: Tape Drive Features								
Direct SCSI tape control	●	○	○	**	○	●	○	○
Retention tapes	●	○	○	**	●	●	○	○
Rewind tapes	●	○	○	**	●	●	○	○

Program	Ami-Back 2.0e	Byte 'n' Back 3.1.1	ExpressCopy 1.56	FlashBack v2.05	MRBackup Pro. 1.12	QuarterBack 5.0.2	SuperBack 2.0	BackUP v3.5
Erase tapes	●	○	○	**	●	●	○	○
Scan tapes	○	○	○	**	●	○	○	○

Table 5: Other Features

ARexx support	◑	○	●	○	●	●	○	○
On-line help	●	○	○	●	○	○	○	○
Keyboard equivalents	●	○	●	◑	◑	●	●	○
Password protection	●	○	○	○	○	●	○	○
Hard & Softlinks support	●	○	○	○	○	●	○	○
Saves user configuration	●	●	●	●	●	●	○	●
Supports macros	○	○	◑	○	●	●	○	○
Amiga voice support	○	○	○	○	●	○	○	○
Backup Scheduling	●	○	◑	◑	◑	◑	○	○
Graphic-based	●	○	○	○	○	○	○	○
Script-based	○	○	◑	◑	◑	◑	○	○
Other Utilities Included	○	○	○	○	File mgmnt.	○	○	○

Table 6: Docs & Tech Support

Overall documentation quality	Good	Poor	Good	Good	Good	Good	Good	N/A
Glossary	○	○	●	○	○	○	●	N/A
Index	●	○	○	○	●	○	●	N/A
Tech support number	●	●	●	●	●	●	●	N/A
Tech support BBS	●	○	●	○	○	○	○	N/A
Tech support FAX	●	●	○	●	●	●	○	N/A

Legend

● Program does specified operation completely.
◑ Program does specified operation only to a limited extent.
○ Program does not support operation in question.

*Applied Engineering's high-density floppy drive (AEHD) is supported, although it will work only under AmigaDOS 1.3.

**Flashback does support SCSI Tape Drives, although it requires that a stand-alone SCSI driver be supplied by the SCSI controller's manufacturer to function.

ExpressCopy Restore), ExpressCopy has a respectable features list, including support for up to four 880K floppy drives, Applied Engineering's high-density floppy, and a healthy set of file-inclusion and -exclusion options. Only it and MRBackup Pro save data in AmigaDOS format.

Back-up times were a little on the slow side, with ExpressCopy ending up near the bottom of the pack on both floppy-disk tests. In the features race, ExpressCopy is simply outgunned by such feature-laden programs as Ami-Back, Quarterback, and MRBackup Pro. ExpressCopy's interface is somewhat cluttered and confusing; during backups, the program flips between the back-up screen and an unusual system of windows on the Workbench screen.

ExpressCopy does have a number of things going for it. It's the only back-up program tested here that can make duplicate copies of back-up disks, and the informative spiral-bound manual is a pleasure to read. If you have a pressing need for back-up disks in AmigaDOS format, ExpressCopy is worth a look.

FlashBack v2.05
Advanced Storage Systems
$79

FlashBack placed well in both floppy back-up tests, coming in third in each case. In terms of features, FlashBack falls squarely in the gap between the floppy-oriented back-up programs (Byte'n'Back, SuperBack, and ExpressCopy) and the feature-laden back-up juggernauts (Ami-Back and Quarterback). FlashBack is one of three back-up programs (including Ami-Back and Quarterback) to support Image file backups, allowing MS-DOS and Mac partitions (accessible through an emulator) to be backed up to a back-up device.

FlashBack does support SCSI tape drives; however, that support requires a tape driver supplied by the manufacturer of the SCSI controller. Since the A3000 I used to test these programs does not ship with a SCSI driver (none of Commodore's machines do), FlashBack refused to recognize the SCSI tape drive used in those tests. FlashBack was designed with support for Advanced Storage Systems' own Nexus SCSI controller in mind; if you own one, FlashBack is an excellent choice.

MRBackup Professional 1.12
MR Software
$25

Formerly published by the now defunct TTR development, MRBackup Pro has been available—in one form or another—for quite some time. A commercial version of Mark Rinfret's popular shareware back-up program MRBackup, MRBackup Pro is now distributed and supported directly by its author. ►

In terms of back-up speed, MRBackup Pro came in dead last in every test, including backing up to tape drive. Configuring MRBackup Pro to include or exclude certain files during a backup—a point-and-click operation in other back-up programs—requires that the user create script-like "filter" files.

Slow back-up speeds and script-file profusion aside, MRBackup offers a wealth of features. It's the only back-up program we tested that can save data in both AmigaDOS and variable (12/16-bit) compressed formats. Its ARexx support was the best of any program tested, with nearly four dozen available commands.

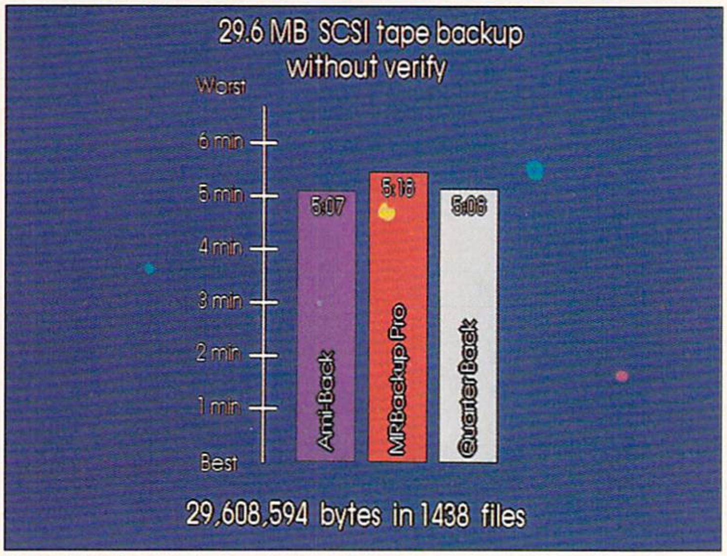


Figure 3. SCSI streaming-tape back-up times.

Finally, the included file manager allows users to perform a wide range of file-management operations, such as copying, moving, and deleting large numbers of files. If you need a powerful set of ARexx commands in your back-up program and don't mind tangling with script files, MRBackup Pro is the program to get.

QuarterBack 5.0.2
Central Coast / New Horizons
$75

Over several years and quite a few revisions, Quarterback remains one of the most popular Amiga programs available; the latest version of Quarterback is the best version yet.

QuarterBack turned in solid performances in all three tests, coming in second in the nonverified floppy back-up, fourth in the verified test, and a close second in the tape back-up benchmark. These respectable back-up times are supported by a lengthy features list, including support for a wide range of back-up media and a wide range of back-up options. Like Ami-Back, Quarterback supports SCSI back-up devices directly (unlike MRBackup Pro, which requires a software tape handler and editing of your mountlist file, and FlashBack, which requires that the SCSI controller have its own tape driver).

Quarterback's AmigaDOS 2.0-adherent interface was arguably the cleanest and most uncluttered of the bunch, making finding a certain feature or option quick and painless. Quarterback's developers have taken a good program and made it a great one.

SuperBack 2.0
The Disc Co.
$39.95

SuperBack has been available in the Amiga market for quite some time. Developed by MKsoft and published by The Disc Company (which is now a wholly owned subsidiary of Activision), SuperBack—like Byte'n'Back and ExpressCopy—supports only hard-drive backups to floppy drives.

SuperBack had a mediocre showing in the floppy-disk back-up tests, ending up in fifth place in both of them. SuperBack's interface proved to be rather archaic and unintuitive. Unlike most of the other back-up programs tested, SuperBack does not allow the user to change floppy disks until all of the disks in the back-up drives have been filled. In terms of features, SuperBack has only three major back-up options, and it does not allow files and directories to be excluded on the basis of pattern matching or wildcards.

A few years ago, SuperBack may have been one of the best back-up programs available for the Amiga. Today, SuperBack is an average performer without any exceptional features.

Rating the Pack

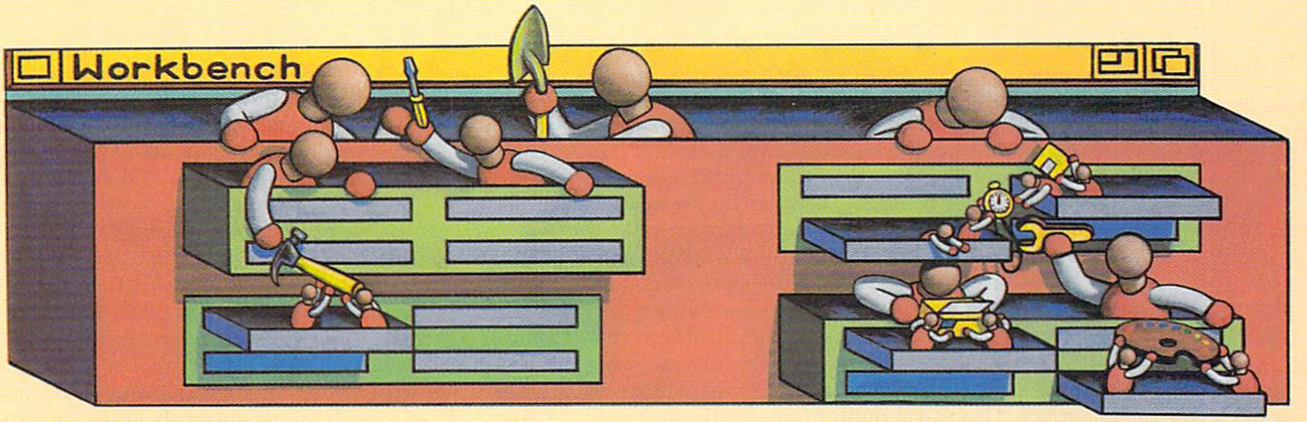
After all of the testing and comparisons, most of these programs fall within one of two broad categories. Programs like ExpressCopy, Byte'n'Back, and SuperBack concentrate primarily on backups to floppy drives, with correspondingly small feature sets. At the other extreme, Ami-Back, QuarterBack, and MRBackup Pro take the kitchen-sink approach, throwing in a wide assortment of features and capabilities. FlashBack falls between these two camps—offering advanced features such as tape support, image backups, and on-line help, but lacking others such as ARexx support.

So which back-up program is for you? If you perform a limited number of back-ups, don't need support for media other than floppy drives, and want to get your back-up done in a hurry, Byte'n'Back is a good choice. Keep in mind, however, that Byte'n'Back is a one-trick back-up pony; it offers great speed, but not much else.

At $25, the best value is undoubtedly MRBackup Pro, which boasts a robust range of features and a bonus file-management utility. MRBackup's heavy reliance upon script files, however, may deter novice users.

As for the best overall back-up program, that award is shared between two solid candidates: Ami-Back and QuarterBack. The gap between these programs and the rest of the back-up utilities reviewed here is a wide one, with Ami-Back and Quarterback both offering impressive lists of features, quick back-up times, and slick, responsive interfaces. Ami-Back and Quarterback herald a new era in Amiga utility software; whichever you choose, you won't be disappointed. ■

*Jeff James has been using hard-drive equipped Amigas for more than four years. A frequent contributor to several computer publications, he is currently a student at Colorado State University where he is majoring in Technical Journalism. Contact him c/o **AmigaWorld**, Editorial Dept., 80 Elm St., Peterborough, NH 03458.*



Digging in to DOS

A SERIES THAT EXPLORES THE AMIGA'S RELEASE 2 OPERATING SYSTEM

In part 4 of our series we tell you how to use the bitmapped and outline text fonts included with AmigaDOS 2.

Workbench 2 provides some much needed enhancement to the Amiga's system of handling different sizes and styles of text. Before the release of AmigaDOS 2.0, the only Workbench application that could make use of the various fonts provided with the system was Notepad, a program that was eliminated in 2.0. As far as the Workbench itself was concerned, you could choose any style or size of text that you wanted—as long it was Topaz 8 or Topaz 9. By contrast, the new AmigaDOS gives you the freedom to choose the typeface in which Workbench text appears, and supplies more font styles and sizes from which to choose.

Workbench 2 retains the traditional bitmapped system fonts, and adds support for Compugraphic outline fonts. Having two different kinds of text fonts available can be confusing, but is much less so once you understand their relative strengths and weaknesses. The main difference between bitmapped fonts and outline fonts is the way in which they store information about the shape of text characters. Bitmapped, or raster, fonts contain information about the actual dot pattern that forms each line of the letter ("three blank spaces, then two black dots, then two more blank spaces," etc.). Outline, or vector, fonts contain instructions for how to draw the lines that form the character ("ascend from the baseline at a 60-degree angle for 78% of the character's height, then descend at a 60-degree angle for the same distance").

PROS AND CONS

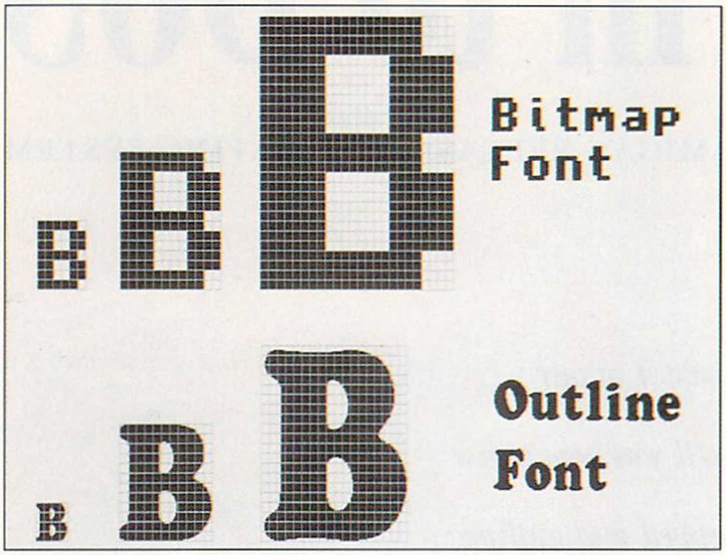
The traditional Amiga system fonts are bitmaps, and their font files contain pictures of each text character at a fixed size. Release 2 does provide some tools for scaling (changing the size) of bitmapped fonts, but even so, it is not possible to produce smooth text characters at large sizes. At best, characters that use slanted lines or curves have a jagged, "stair-step" look to them. At worst, characters may be misshapen, with one side enlarged more than the other in order to fit a particular size. For really good results, you need an individ- ►

BY SHELDON LEEMON

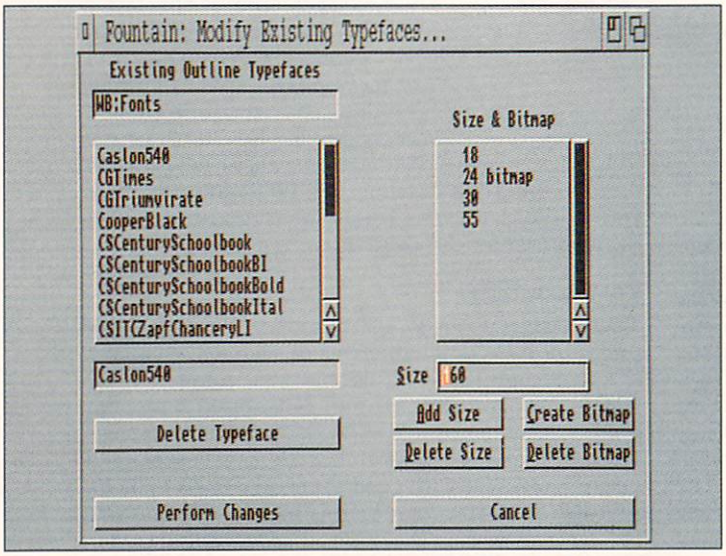
ILLUSTRATED BY BARTON STABLER

ually designed font file for each size of a bitmapped typeface that you intend to use. On the other hand, bitmapped fonts are quick to load, and their file sizes are generally smaller than those of outline fonts.

The font data and rendering software for the new 2.0 outline fonts is provided by AGFA Compugraphic, a large vendor of typefaces. Because these font files contain instructions on how to draw the characters, and not just pictures of their shapes, they permit applications to generate type at almost any given size from a single font file. And among the text generated, large characters look just as smooth and well-rounded as smaller ones. This makes outline fonts particularly useful for output to devices of differing resolutions, such as monitors (about 75 dots per inch) and printers (180–300 dots per inch). Outline fonts give you good-looking printouts even on a dot-matrix printer.



Bitmapped fonts retain their blocky shape when enlarged, but outline fonts take advantage of higher resolutions to present a smoother appearance.



You can use the Fountain program (called Intellifont in 3.0) to change the default sizes for Compugraphic fonts appearing in text requesters, and to generate system-bitmapped fonts.

The major drawback to outline fonts is that generating text characters from mathematical instructions is relatively slow and requires a fair amount of processing power. You cannot even see a preview of the type style until your computer has generated the entire character set, a process that takes about ten seconds if you have a hard drive and accelerator, longer if not. Another disadvantage is that small text may not be as well-formed as larger characters, because it is difficult to draw a line at a precise angle when you only have a small grid of dots to work with.

The Compugraphic technology used in Workbench 2 is just one of many that are currently in use on personal computer systems. Adobe's PostScript font technology is probably the most famous, but other popular formats include Microsoft's TrueType and Bitstream's outline fonts. On the Amiga, Final Copy II uses a proprietary system of outline fonts.

Although these systems operate on the same general principle as the Compugraphic fonts, none of the fonts themselves are directly compatible. In fact, several different versions of Compugraphic's own font technology have been used at various times by Amiga programs such as Professional Page and DynaCADD, and even these cannot be used interchangeably with the current version. It is possible, however, to convert some Type 1 PostScript fonts to Compugraphic outline fonts using the FontManager utility included with Gold Disk's Professional Page program. There are many public-domain PostScript fonts, and quite a few of them have already been converted to 2.0 Compugraphic format. You can also purchase a wide variety of additional Compugraphic typefaces from Gold Disk, or from AGFA Compugraphic itself.

In Practice

Once you have release 2 installed, how do you take advantage of the new fonts? The short answer is that you use them just like the old fonts. When a program checks to see what fonts are available, the system software reports that Compugraphic fonts such as CGTimes and CGTriumvirate are available in default sizes of 15, 30, 45, 60, and 75 pixels high. There are, however, no actual bitmaps for these fonts stored on the disk. When you select CGTimes 30, for example, the operating system uses the outline-font data to create a system bitmap of the CGTimes font at size 30.

What if you want to use a size other than the defaults? If the program you are using takes advantage of the new ASL font requester that is provided as part of release 2.1, you can create a new type size very easily. In addition to presenting a scrolling list of available sizes, the requester has a selection box in which you can specify the type size by clicking in the text gadget and typing in the numbers. If you type in a font size of 100, that is what you will get. Because Workbench 2 includes bitmap-scaling routines, this procedure works even with the normal bitmapped system fonts such as Topaz, Diamond, and Ruby. The difference here is that while you can make the system fonts bigger, they will not look very good at the large sizes and may even appear distorted. You should also note that there is a limit to how large you can make your fonts. Many programs will not recognize fonts that are taller than 160 pixels.

What about those older programs that do not use either the ASL font requester or a similar requester that ►



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Requires AmigaDOS 1.2 or higher and a minimum of 1MB RAM.

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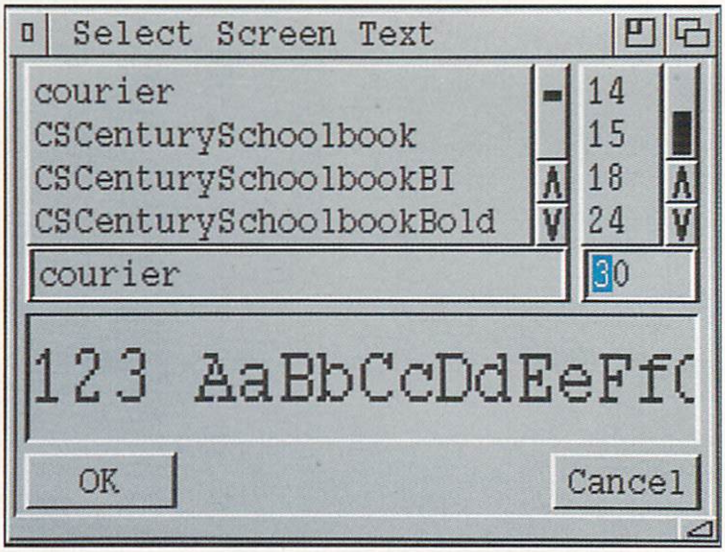
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allows you to specify type size? You can still use custom type sizes with those applications through the Fountain program in the System drawer (on 3.0, the name of this application was changed to Intellifont). When you run Fountain, you will see a list of the fonts in the current FONTS: drawer, and a button in the lower-right corner marked Modify Existing Typefaces. Pressing that button takes you to a screen displaying all of your Compugraphic fonts in a list. When you select a typeface, the default sizes for that face appear. You can delete any of the default sizes or add new ones. Once you've made all of the changes you want, press the Perform Changes button and you will have a new set of default sizes. From then on, when an application requests the available sizes for those fonts, it will see the sizes that you set.

Although Appendix D of the 2.0 manual states that you can change the default sizes for all fonts at once by setting an environment variable called Fountain, this does not seem to be true in the current version (if it ever was). If you want to change the default sizes, stick to using Fountain.

You can also use Fountain to create and save actual bitmapped system fonts for any size Compugraphic font. Although this takes up more disk space, it will be faster to load that particular size font, because the system won't have to generate it each time. The fonts you generate can also be used on 1.3 systems, and can be converted to Video Toaster bitmapped-font format using the ToastFont program. ■



The 2.1 ASL font requester not only presents a scrolling list of available type sizes, but also lets you enter a size not already on the list.

Sheldon Leemon, a respected authority on the Amiga, recently finished the fourth edition of the ***AmigaDOS Reference Guide*** *(Compute! Books), a guide to using the CLI under operating-system releases 2 and 3. When he's not writing, you can often find him at Slipped Disk, a Detroit-area Amiga dealership.*

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ACCENT ON GRAPHICS

Putting Things In "Perspective" Part 2

48

A continuing series of tips, techniques, and tricks for creating more imaginative Amiga graphics.

By Joel Hagen

LAST MONTH'S COLUMN explored using aerial perspective as a method of achieving an illusion of depth in landscape painting. In illustrating the technique, a landscape was painted in a series of simplified overlapping planes. This same approach serves to explore the phenomenon of parallax as it applies to animation.

The Parallax View

Parallax is defined as the apparent displacement of an observed object due to a change in position of the observer. Our stereo vision is the result of parallax due to the separation of our two eyes. Close one eye, hold up your thumb, and stare past it to a point across the room. Now switch eyes and stare at the same point. The thumb appears in a different space relative to the rest of the room. Astronomers use parallax to measure the distance to stars as the earth changes position in its orbit.

When you are riding in a car looking out a side window, notice how parked cars, fences, and anything else near you whips by at a pretty fast speed. Objects farther from your eye, however, seem to move past your field of view more slowly. And very distant areas hardly move at all. Amiga animators can simulate this parallax effect to heighten the illusion of depth in a moving scene. One way to do this is by painting the image in independent layers that can be scrolled at different rates. If these animated layers are seamless loops, an effect of continuous motion results. You frequently see such loops scrolling behind running cartoon characters.

For example, in the accompanying illustration, the top-left panel depicts a stationary background image 320 pixels wide, which you can then copy to every frame of a 100-frame animation. The middle ground image (center left) might be 480 pixels wide, and would be moved its own width over the course of the 100 frames. The foreground image (bottom right) might be 960 pixels wide, and also be moved its own width over the 100 frames. Thus, each successive layer travels faster to cover a greater distance in the same time period. You can paint and animate as many layers as you like, each one wider than the last. As you might guess, there are some tricks to this, so let's take the process step by step in DeluxePaint (Electronic Arts).

First, create and save the background as a Picture at whatever resolution and screen size you intend for the finished animation, for instance 320x200. Next, create the middle ground image. To do this, clear the screen and select Page Size from the Picture menu. Enter a new width greater than 320 that is a multiple of 16, for example 480. You can scroll left and right to paint within this image space by using the left and right cursor (arrow) keys.

For the middle ground layer to play in a continuous loop, its right edge must exactly match its left edge. One way to do this is to paint a finished section of this layer in the middle of your screen, about 100 pixels wide. Then use the right mouse button to cut a brush that divides this section in half. Using the cursor keys to scroll, carefully place the right half of the landscape section on the left side of the screen and the left section on the right side of the screen as illustrated in the "Middle Ground" panel. Now, complete the landscape—making sure not to approach the edges of the screen as you paint. Save this middle ground as a Picture.

Repeat the same process for the foreground, with a Page Size wider than that of the previous layer, for instance 960, another multiple of 16. You can create as many layers as you

Perspective tricks in Part 2 show how simulating the parallax effect can heighten the illusion of depth in your animations.

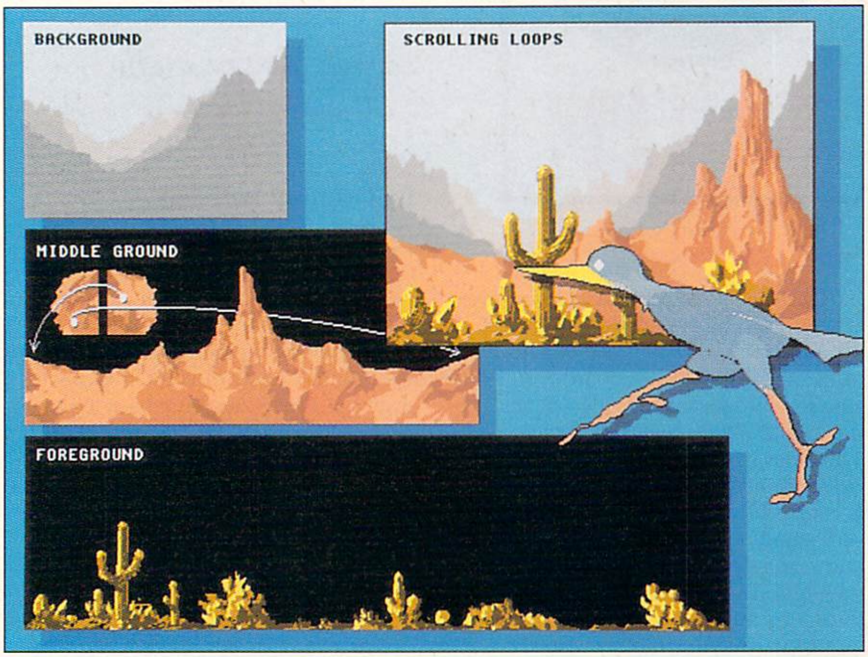
like in this manner, each wider than the last. Save each layer as a Picture.

READY TO SCROLL

To create the parallax scroll animation, load the background image as a Picture and enter 100 for Set# of Frames in the Anim menu (or whatever number of frames your animation will be). Next, load the middle ground image as a Brush. I repeat, as a Brush, not as a Picture. This allows you to manipulate images larger than the screen. Make the background color transparent in the brush by first selecting that color with the right mouse button. Next, in DPaint4, select Change Transparency from the Brush submenu of the Color menu. In Dpaint3, Change Transparency is in the Change Color submenu of the Brush menu. A bug in Dpaint3 requires you to perform this operation twice to have it take effect. Use another right mouse-button color the first time, then the proper right mouse-button background color the second time.

Next, press the Alt-x keyboard combination twice to shift the handle to the lower-left corner of the brush. Drag your cursor/brush-handle completely to the lower-left corner of frame 1, stamp it down with the left button, and click on Undo. Bring up the Move requester and enter the width of the brush as the X Distance. Preview and then press the Draw button. When the Draw operation is complete, verify that you are again on frame 1 and then press Alt-x again to shift the brush-handle to the lower right of the 480-pixel brush. Drag the cursor again to the lower-left corner of frame 1, stamp it in place, and undo. Return to the Move requester, preview again, and then click on Draw. The result should be a continuous, seamless scroll of the middle ground in front of the background hills.

Load the next layer as a Brush and repeat the entire process. Use the new brush width as the X Distance in the Move requester—960 in the case of our foreground example. Press the 4 key to play the animation in an endless loop. The nearer sections of landscape scroll faster than those more distant, mimicking the parallax phenomenon and adding a powerful illusion of depth to your creation. Experiment to determine the best brush widths for successive layers. A seamless parallax loop like this is a good backdrop for a walking or running character like the roadrunner animbrush shown in the illustration.



In "Desert Run" (above), the landscape animation represented on the right is composed of the layers shown on the left. Each layer is scrolled at a different rate to create a seamless parallax loop that can serve as a background for a running character.

Joel Hagen's credits include work in art, astronomy, science fiction, and software development. Write to him at 10512 Sawyer, Oakdale, CA 95361. Please include a stamped, self-addressed envelope for a reply.



The Camcorder Can Do!

With a little finessing, you can get a camcorder to serve you well as the sole or major piece of video gear in your Amiga studio.

By Geoffrey Williams

GETTING INVOLVED WITH computer video can be expensive. Instead of drooling over a $200 piece of software or even a $1000 24-bit board, you find yourself hungering for video gear starting at $2000 to $10,000 and up. This does not mean, however, that video is only for the fiscally endowed. It is possible to do video work with a very small investment. The key is to know exactly what you need and get only that. If video is more of a hobby than a vocation, it is especially important to spend your money wisely.

The most important first purchase is your video recorder. What is the best type of recorder for someone getting started on a budget? That miracle of miniaturization and modern technology, the camcorder. With a single purchase you will acquire a means for recording live video and a recording deck for laying down Amiga graphics onto tape. After discussing the basics of how to choose a camcorder, I'll explain how you can make it work with other equipment, and describe some of the really neat things you can do with it through your Amiga.

Formats and Features

Selecting a camcorder is tough, as there are so many choices available. But as the market increases, prices decrease. Now, most camcorders require a reasonably small investment. Even an industrial-quality Panasonic S-VHS camcorder costs only around $1300, and others are much less.

The type of tape format you want to use should be one of your first considerations. There are three basic types of camcorders: VHS, S-VHS, and Hi-8. If you plan to make copies of your tapes or do editing from them, you can rule out VHS. Copying from one VHS tape to another does not yield a very good final product, especially with Amiga graphics, which tend to bleed and crawl on tape.

S-VHS and Hi-8 both give you very good picture quality, and you can get reasonably good results by copying to a second tape—even to VHS. The important thing to remember, though, is that you cannot play either of these tape formats directly from most home VCRs.

S-VHS tape comes in two varieties. The regular format comes housed in a cassette the same size as VHS tape uses. Camcorders that support this format can also play VHS tapes and record onto them in the VHS format. The other format, S-VHS-C, comes in miniature cassettes. It is used in palmcorders and similarly small cameras, which cannot play or record regular-size VHS tape directly. You can buy adapters, however, in which to place the smaller tape so that you can play a small tape recorded in VHS mode in your home VHS VCR.

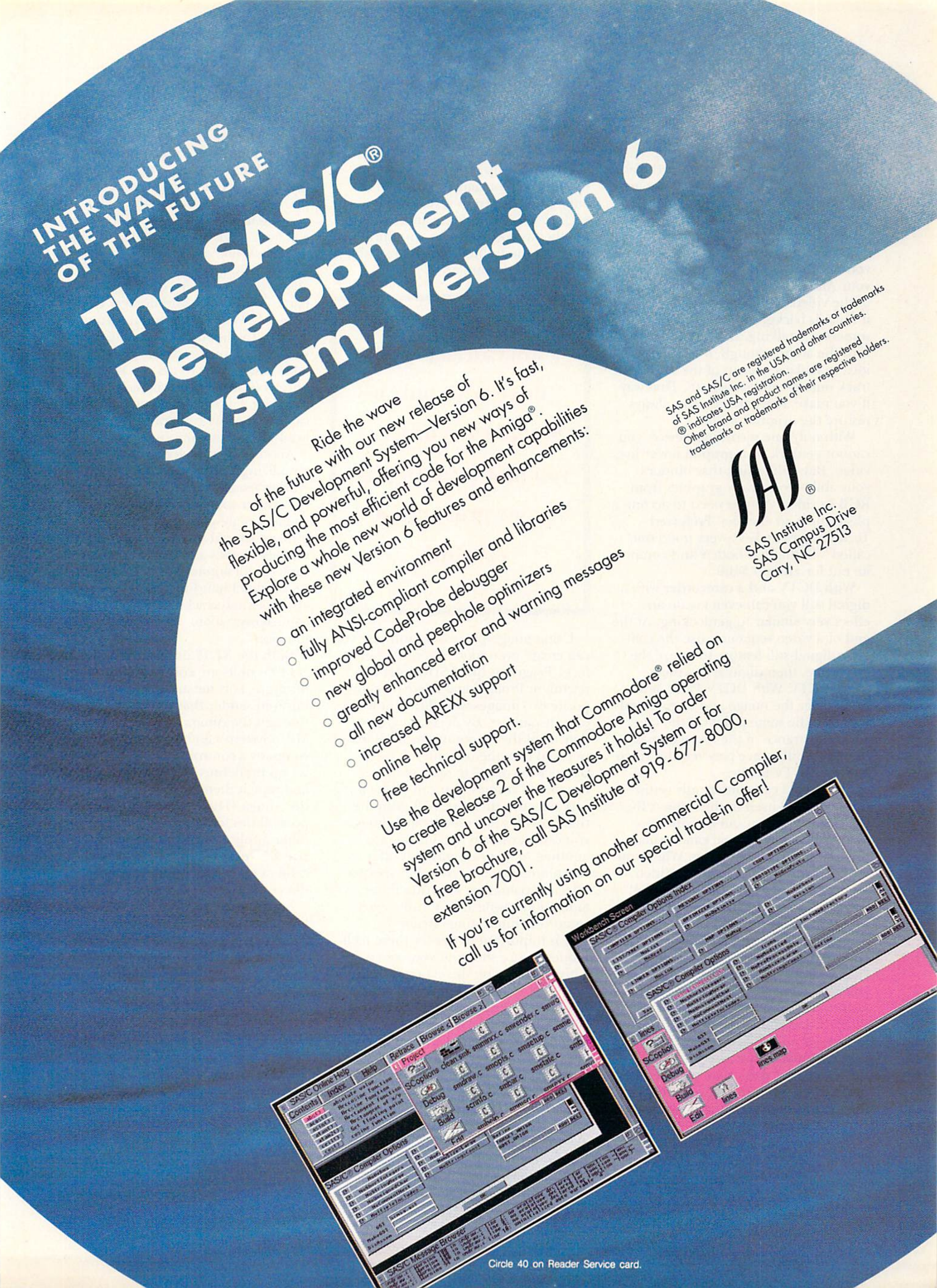
Hi-8 is another small tape format. Hi-8 cameras, correspondingly, tend to be very small and light. While they are not compatible at all with VHS, they have a slight edge in the ability to record audio and a slightly better picture.

What features should you look for in a camcorder destined to take center stage in a video studio? Because it will be your only video recorder, you will need to be able to use it for editing. This means that it should have flying erase heads and the ability to do both video and audio inserts. You might also consider a video digital freeze; this will prove very important if you want to digitize video images using Digital Creations' DCTV.

You Can Make It Happen

Producing a video using only a camcorder requires much planning. Lacking the ability to edit from one deck to another, it is best to shoot everything in sequence. If you must shoot out of sequence, figure out the precise length of the sequence you will have to leave room for between your other shots. Then record with the lens cap on for exactly that amount of time at the place you will enter it on tape (you cannot do a video insert on unrecorded tape): Using the video-insert capability, set the starting and ending points for the camcorder. Press the button and the camera will start recording at precisely the right spot, and then automatically stop recording when it reaches the end of the section you have set up, making for a seamless insertion.

You can use the same technique for ►


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inserting Amiga-generated titles or images. Figure out ahead of time how long you want the computer graphic to appear on the screen, and record black (with the lens cap on) for that amount of time. It is then a simple matter to insert the graphic right where you want it between your video segments.

With an audio-dubbing capability, you can then go back and add music to your Amiga graphics—and to any part of the video. You can even redub voices if there is background noise when someone is talking. Before fiddling with the audio, though, it is a good idea to make a backup of the soundtrack onto an audio cassette. That way if you make a mistake you can always restore the original audio.

With only one recording device, you cannot genlock your graphics over live video. But don't think that hinders your ability to convert graphics from RGB to video. All you need to accomplish this is an encoder. Preferred Technologies makes a very good one called VIP that has both S and composite out for around $100.

With DCTV and a camcorder with a digital still you can even create an effect very similar to genlocking. At the end of a video sequence, use the camera's digital-still feature to freeze the last frame, then digitize this image using DCTV. With DCTV Paint, add titling over the image and start recording from the same point on the tape. The appearance of the text will mask the slight difference between the video and the DCTV image.

Although a camcorder-only setup does not lend itself to the same A/B-roll transitions you can do with NewTek's Video Toaster, you can simulate them with careful planning. When you want a transition between two video sequences, make sure that the end of the first and the beginning of the second shots show no movement, and leave enough space for the transition. You will have to figure out how long your transition will be ahead of time. If you want a five-second transition at 15 frames per second, then you will need a 125-frame animation. Time your animation and your insertion space very carefully before actually adding the insert. But don't plan your insert down to the second; give yourself a little extra room on the tape in case you make a small error in timing.

You can create just about any type of transition. By putting the second image on the swap screen, you can rub through to it or make some kind of enlarging pattern to reveal it. Save each frame with a name and sequential number as you go; when you finish you can load the frames into DeluxePaint or any Anim compiler.

You can get a lot done with only a single camcorder... you just need to plan your production carefully.

Using image-processing software you can create even more interesting effects. Programs like ASDG's Art Department Professional 2 let you composite two images with different levels of transparency. By decreasing the density of the incoming (second) image in equal increments from full transparency to complete opacity over a number of frames, you can create a very effective dissolve. With software that provides morphing capabilities, you can transform one image into another. Most programs that offer morphing also provide other special-effects capabilities; inserting these animations using DCTV can create some very interesting effects.

It is important to master these techniques before shooting your video. This will give you the expertise to know how long to record blank spaces and how to time out transitions. Go out and shoot some video that you can practice with, and try different transitions and effects.

Souping Up

When you're ready to add to your camcorder-centered setup, take a look at some of the peripherals designed just for cameras. One of the more exciting new products, designed for cameras weighing under four pounds, is the Steadicam Jr. ($595, Cinema Products). It is a downsized version of the regular Steadicam used for steadying motion-picture and professional-video cameras. When a television or movie scene follows a person walking up the stairs or running through a twisting trail, chances are a Steadicam was used to give a smooth feel to the motion. While not as sophisticated as the $30,000 models, Steadicam Jr. allows you to do very smooth fluid pans, booms, tilts, and dollies. You hold it in your hands and use your arms as the boom, with the Steadicam keeping the picture stable for you. It takes some effort to get the knack, but once you have it you will never be tied to a tripod again—and you'll be able to capture moving camera shots that would have been impossible otherwise.

Another new device that offers some tantalizing possibilities is CameraMan (ParkerVision). Once you attach your camcorder to a CameraMan unit, it lets you automate panning and tilting. Using a special wireless microphone that also serves as a tracking unit, the camera will automatically follow you. An optional hand-held microphone also does autotracking, and gives you control over zoom, record, and pause functions.

Both the XL ($2095) and the UVM ($1495) units are controlled through infrared. This means that if you use an infrared sender that is controllable through the Amiga, such as Interactive MicroSystem's $50 unit, along with the company's control software, you could set up predefined camera movements and repeat them, triggering them from the Amiga. This opens up tantalizing possibilities for motion control and other applications. The more expensive XL version supports a heavier camera up to 15 pounds and has a direct interface to the Video Toaster.

Such camcorder add-ons make your life easier and snazzier, but so do most video peripherals. Remember, you can get a lot done with just a single camcorder; you just need to invest some time. As your expertise and budget grow, you can add more. ■

*Geoffrey Williams is executive producer of CBC Communication and director and newsletter editor for the Amiga VideoGraphics Guild. Write to him c/o **AmigaWorld** Editorial, 80 Elm St., Peterborough, NH 03458.*

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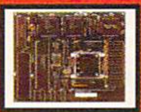
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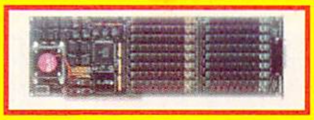
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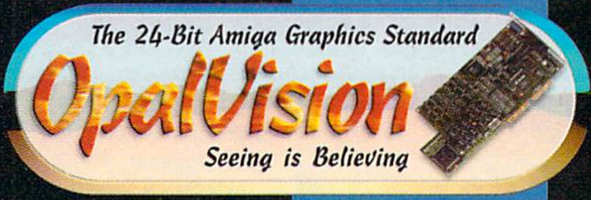


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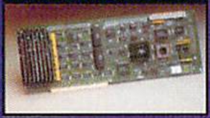
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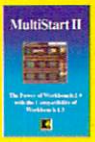
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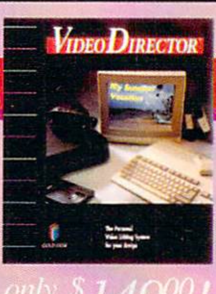
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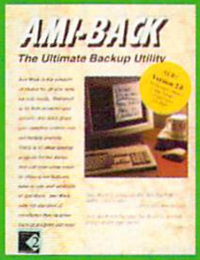


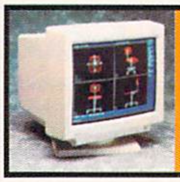
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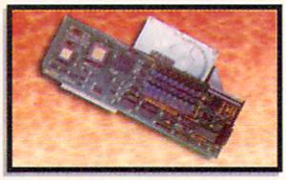
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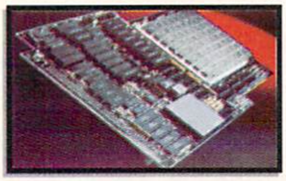
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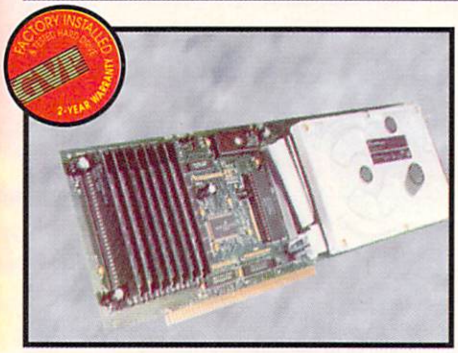
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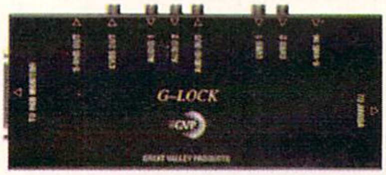
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From p. 26.
combine a fax and a voice message in a single file. You can later view the fax directly or convert it into an IFF file; both very fast processes. A new addition to the program, which should now be available, is the ability to automatically forward fax and voice messages to a remote number.

Dial Direct

On the out-going side, the program includes a database for organizing names, addresses, and phone numbers, with autodial and a redial queue. In the Quickdial screen, you can specify a list of 36 frequently called numbers for one-click dialing. Databases can be password protected, and you can index any field.

You can send faxes in several ways. You could convert an ASCII file to a fax, but would lose such formatting as boldface and underlining. Pictures convert to faxes more easily. The best way to go, however, is to use the Print-to-Fax option: Change your Preferences printer driver to the provided Fax printer driver. Now you can use any program for sending—a word processor, a desktop-publishing program, or even DeluxePaint (Electronic Arts). Print from them as you normally would, and a requester pops up asking to which mailbox you want the fax saved. The scheduler then pops up, letting you specify when to send the fax. You can send a fax or a voice message to several numbers or a single number.

There are a few things that I would like to see PhonePak do differently. Like many people, I have two lines running though a single phone cable to my two-line telephone, and PhonePak does not pass through the second line (a problem with many phone-related peripherals). Also, when sending faxes, I often wish PhonePak offered a customizable cover sheet that automatically inserted the time, date, and the names of the sender and recipient. The Line Manager, a small utility that must be run for PhonePak to answer the phone, should have a customizable window with the names of mailboxes you want to monitor for messages. These names should be checked when a new message has come in, so you don't have to run the PhonePak software to check for messages. Clicking on the name should load PhonePak with the corresponding mailbox active so that you can play the messages.

Even without these features, PhonePak VFX is a very sophisticated combination of hardware and software at a reasonable price. It will quickly save you the money you invest in it.

—Geoffrey Williams

Final Copy II

Softwood, $99.95

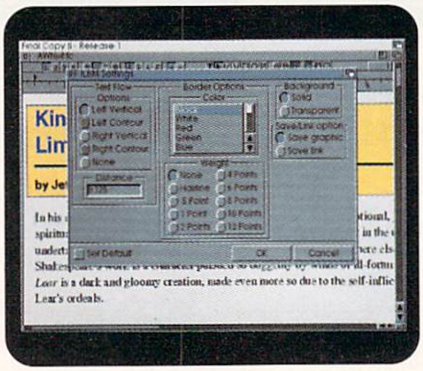
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Improving on an already popular word processor, Final Copy II is loaded with new and unusual features. All of its original amenities are still present, including a spiffy Workbench 2.0 interface, crisp output using outline fonts, robust support for IFF graphics, and a lucid manual. Final Copy II adds paragraph style sheets, master pages, a suite of object-oriented drawing tools, a 1.4-million word thesaurus, support for 24-bit IFF files, and a plethora of other enhancements.

Style Setter

Accessing all of Final Copy II's new features is simplified by several interface enhancements. ARexx and the Amiga clipboard device are fully supported, and an attractive button bar at the top of the screen allows instant access to commonly used functions. On this strip are buttons for toggling line spacing, paragraph justification, tabs, hyphenation preferences, and master-page selection. Final Copy II's master pages should be old hat to veteran desktop publishers. With this feature, you can create a set of guidelines—much like a template—to which all the pages in your document conform. The text and graphics placed on a master page appear on every page in your document, perfect if you'd like to add a graphic border to each page in a newsletter or brochure. Master pages work well for books and small desktop-publishing projects, where stylistic cues such as page accents (lines and shaded areas) are repeated on each page.



Final Copy II lets you tailor your text around graphics.

On a related note, Final Copy II's style sheets do for body text what master pages do for the page itself. Style sheets act somewhat like document-wide macros, adjusting and formatting your text according to a predefined set of user-specified guidelines. For example, using a style sheet, you can tell Final Copy II to format the body text in your document in a 10-point serif font, with headlines of a size 18 font and subheads weighing in at 14 points. Instead of manually editing each page, you can have the style sheet do it automatically. Final Copy II supports up to 16 named style sheets that can be saved and applied to other documents. Master pages and style sheets make the often arduous task of manipulating large documents a snap.

Once the underlying structure of your document is taken care of, Final Copy II offers a number of tools to help you fine-tune your prose. A 144,000-word spelling dictionary is included, as is a hefty 1.4-million-word thesaurus and a useful—albeit limited—document-statistics option. The dictionary supports user-entered words, and the thesaurus suggests alternative word choices at a mouse click. Unfortunately, the thesaurus offers only two options: find and replace. Being able to selectively look for synonyms or antonyms alone would cut down on time spent on searching for unneeded words.

To Illustrate a Point

In the graphics department, Final Copy II now supports color text. A new oblique-percentage feature also lets you slant text to the left or right, ideal for special text effects. IFF pictures of all stripes are supported, ranging from lowly two-color images to palette-bursting 24-bit creations. Regardless of the pixel depth of the graphics, Final Copy II easily scales, crops, and resizes loaded images with real-time text flow around each graphic. If you need only a line or shaded box to spruce up your document, Final Copy II's structured-drawing tools allow you to create filled and unfilled lines, boxes, and ovals.

Printing your document is where Final Copy II truly excels. The program relies entirely upon a proprietary outline-font format for output, resulting in crisp, readable text that can be printed at the maximum resolution of the output device. Unfortunately, Final Copy II does not support standard Amiga fonts; if you want additional fonts, you must purchase Softwood's. The 11 fonts that are included with Final Copy II are suitable for most uses and the majority offer several type ►


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styles. PostScript printer owners will be able to use Final Copy II's PostScript printing options.

Getting Final Copy II onto a hard drive is easy, thanks to a slick, icon-driven installation routine. Amiga owners with a scarcity of hard-drive real estate should know that Final Copy II occupies a tad under 2.8 megabytes of space when installed. Workbench 1.3 and higher are supported, although Final Copy II was certainly designed with 2.0 in mind.

As impressive as Final Copy II is, some weaknesses are apparent. The lack of Amiga font support is a notable—although not crippling—foible, and the slow typing speed in large documents may deter some fast typists. Some of the features that are *de rigueur* in many other word processors—timed document saves, user-selectable default document paths—are conspicuous by their absence.

Minor faults aside, Final Copy II is a superlative piece of work; Softwood has indeed created a winner. Supporting features often found only in expensive desktop-publishing programs, Final Copy II does have some serious competition; New Horizon's ProWrite 3.3 and Micro-System Software's excellence! 3.0 are very capable products from seasoned Amiga developers. Final Copy II, however, pulls into the lead of the Amiga word-processing pack.

—*Jeff James*

G-Lock

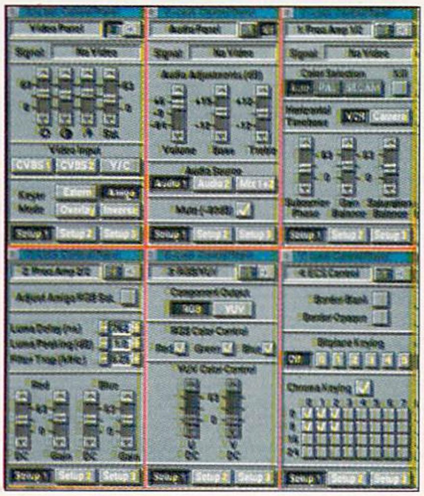
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Graphics overlay and video-format conversion.

Genlocks, encoders, and transcoders have been common equipment in Amiga video studios for quite some time. So, is the brand-new G-Lock new technology or just another genlock choice?

First some background: Basically, video equipment and computers all use specific types of signals to display pictures. Computer signals are generally RGB format, while video can be composite, Y/C (Hi-8 and S-VHS), or YUV, among others. Different video standards, NTSC, PAL, and SECAM add more complications. Basic encoders convert a computer's RGB signal into a specific



To control the G-Lock use the button panels shown, hot keys, or ARexx.

video format. Genlocks encode an RGB signal, mix it with a video signal, and output the combination. Transcoders convert among multiple signal types and typically cost more because of extra circuitry, inputs, and output. The G-Lock incorporates new integrated circuits and provides all three abilities in one device and adds simple audio mixing.

Installation of the six-by-four-by-one-inch black G-Lock box takes only a few minutes. The supplied six-inch cable connects your Amiga's RGB port to the G-Lock, while a fixed cable plugs into your joystick port. Hook your monitor cable to the other end of the G-Lock, and you're done. You have a choice of either two composite-video inputs or one Y/C (S-VHS or Hi-8) with one composite, Y/C, or YUV output. You can simultaneously output either of two monaural audio inputs. All composite video and audio connectors are RCA type, while Y/C video plugs are the standard four-pin mini-DIN. In a standard configuration, video output is always available on each of the RGB, composite, and Y/C connectors. The YUV output is accessible only with a break-out cable (not supplied) in place of the RGB output and without any of the other video outputs available.

G-Lock operation is handled through software interface panels, hot keys, or ARexx. While the Video and Audio control panels are available with a standard installation, you must change your ToolTypes to reach the other four Advanced-Video control panels. The 4:ECS Control Panel is accessible only if your Amiga has the ECS or AGA chip sets. The G-Lock software also lets you save and instantly switch among up to three sets of set-up parameters, meaning you can save and use color-correction (enhancement) settings and so on that are specific for a production.

Two for One

Both genlock and transcoder functions are handled by settings within the G-Lock. You can select a standard Amiga image only, an overlay of Amiga graphics on external video, external video only, or external video inside an Amiga graphic key. G-Lock doesn't stop here; it adds extra features. A full-featured proc amp provides control over brightness, contrast, hue, and saturation values, as well as many other fine video-signal adjustments. The G-Lock also includes an electronic color splitter for slow-scan digitizers, such as NewTek's Digi-View. A supplied ARexx script assists in automating this process.

GVP also includes an ARexx script to provide "transition effects between two composite-video sources (A/B roll)." This sounds great but is very questionable. The script uses the brightness and contrast of the proc amp to fade out one video source and then fade in the second. First, A/B roll alludes to a cut ability, not a fade to black; second the documentation never mentions that to switch smoothly between multiple video sources, you must have time-base-corrected (synced) video sources.

G-Lock contains three major unique features. First, by virtue of its transcoding ability, the G-Lock allows you to convert from a composite-video signal into either a separated Y/C or YUV signal. Second, it can work with Amiga de-interlacers so that you don't have to disable them for your standard Amiga output. Finally, with the special keying abilities, both standard bitplane and chroma keying are available to ECS- or AGA-equipped Amigas.

The built-in keying abilities alone make the G-Lock cost effective. A standard Amiga genlock drops out Color Zero and replaces this area with the external video. When inverse keying is available, Color Zero appears while all other colors drop out to external video. The G-Lock software lets you select between either bitplane or chroma keying. Bitplane selections of 0 through 5 (ECS) or 0 through 7 (AGA) are controllable. Chroma-key values of up to 32 (ECS) or 256 (AGA) colors are valid, letting you acheive very convincing effects.

While I found the audio control very limited, it proved convenient for a simple video-mixing situation. You can switch from either of the mono audio inputs or mix the two channels (same level) into one mono output. GVP suggests that if you have stereo audio sources, you should use a simple Y-cable to combine them.

Screen Test

Enough of the features, what are the results with regard to the quality of the output? The answer is mixed. When viewed on vectorscope and waveform monitor, the factory settings were without question outside broadcast specifications. The documentation includes a calibration procedure that refers to both software and hardware adjustments, which effectively produces a much better signal. The disclaimer that GVP is not responsible for and will not assist in the recalibration, however, concerns me. Additionally, opening the G-Lock voids the warranty. This presents a quandry, unless you are not concerned with the quality of the output signal.

The last caveat is the YUV-output ability. In this price range, the ability to produce high-quality component video is a major breakthrough. The suggestions in the documentation are questionable with regard to output to Beta-Cam SP video components. The technicians I consulted did not believe that using the external sync signal would work properly, because the SP machine expected the sync signal with the Y signal. A possible solution, which I did not have time prior to publication to try, could be a custom cable.

Overall, I was impressed with the G-Lock's versatility. I was also impressed with the ability to control the device with hot keys and ARexx. The software gives you a great deal of control over the device for fine tuning the quality of the signal. The ability to save set-up configurations also gives you interesting video-processing capabilities. The G-Lock is a versatile and capable device, but I suggest you leave the fine tuning to a video technician.

—Steven Blaize

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uct that keeps improving. This is the case with OpalVision and its recent software upgrades.

OpalVision 1.1 now comes bundled with MakeAnim 24 and PlayAnim 24 to allow real-time 24-bit animation. With these utilities you can convert your images generated with 3-D software, for example, into 24-bit animations that play back at up to 30 frames per second (fps) through the OpalVision display.

Two on the Move

A stand-alone program, MakeAnim 24 automatically converts and scales a series of 24-bit IFF images to the new OpalVision animation format. This is not a highly compressed format, which contributes to faster playback at the expense of bigger files. (If you are working with 24-bit images, however, you probably have a big hard disk anyway.)

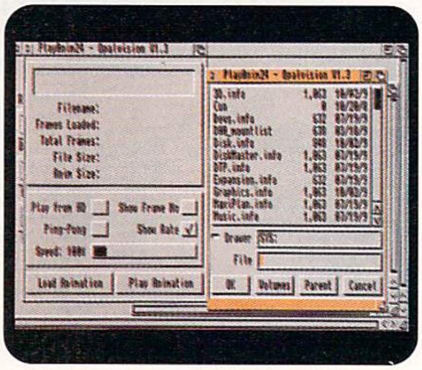
Using MakeAnim 24 is very easy. You simply select the first and the last of a series of images, the color depth (from eight to 24 bits), the image size, and whether to use compression or not. The program does the rest.

PlayAnim 24 loads and plays animations very quickly. Full-size, overscan 24-bit animations cannot play back in real time, but if you need to view your animations at 30 fps, you can render them at a smaller size or use fewer bitplanes. Playback is very smooth, and an option tells you the speed. If you don't have a lot of memory, PlayAnim 24 can play animations directly from disk at the expense of some speed.

My favorite aspect of OpalVision's animation capabilities is that you can preview your work before single-frame recording it to tape. This is extremely useful if you don't own a single-frame recorder, allowing you to preview your finished animations before you go to a service bureau or to record them to tape in real time for client approval. This alone saves you time and money.

Alpha Painting

OpalPaint has also received many new additions. ARexx is now fully supported, with loads of commands. By writing your own ARexx scripts, you can not only automate your painting process, but also create images from formulas. The possibilities are very nice. The Magic Wand is still not supported, but Alpha Painting is, allowing the creation of transparencies and, with the forthcoming switcher, multiple layers. There is also a new background fixing feature that allows you to paint over a background without ruining it. Holding down the Alt key while moving your cursor over an image gives you



OpalVision's PlayAnim 24 displays 24-bit animations to your specifications.

the HSV values of the pixels underneath, which is very helpful in defining tolerances for cuts and fills. With automatic brush picking, you can pick a brush of any format without the background, if the latter is composed of a single color. For gradient fans, eight editable gradients are at your disposal instead of just one. The new splatter brush and a custom paper allows you to use any image as the paper texture. Therefore, you can create your own papers.

Speed has been cranked up, as well. Loading JPEG images now takes a fraction of the time required by version 1.0, and the ZAP tool is 200% to 300% faster than before. For digitizing-tablet users, pressure sensitivity has been improved, allowing for more precision at lower pressures.

The included Show24 not only lets you display 24-bit IFF files, but also JPEG compressed images and normal Amiga IFFs of up to 256 colors. This allows Amiga 2000 and A3000 users to view images created on the A4000.

OpalVision 1.1 software now comes in ten floppies, and an improved installation program takes care of installing the new modules for you. Should you have any questions, Centaur offers excellent customer support by telephone and its new BBS (310/793-7142). New modules are posted frequently and can be easily downloaded.

Direct Support

In addition, an ever increasing list of programs offers direct support for OpalVision. Aladdin 4D (Adspec Programming), for example, renders its 3-D objects to the OpalVision display. Included with OpalVision 1.1 are a loader and an operator for Art Department Professional and MorphPlus, ASDG's excellent image-manipulation program and high-quality morphing software, respectively.

The saver module displays your images on the OpalVision screen in 24-bit color, ►

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and you can even view images that are larger than the screen. The operator is very interesting, allowing you to call OpalPaint from ADPro and share the same image between both programs. Therefore, if you are using ADPro and you want to retouch a picture, for example, you can easily take advantage of OpalPaint's great tools via the new operator.

It is a pleasure to use a package like OpalVision. I can hardly wait to see the new hardware add-ons. If they perform well, the OpalVision package may be very serious competition to the Video Toaster. Not only are support for Y/C, YUV, and composite planned, but also chroma and luma keying. OpalVision is already starting with an advantage over the Toaster, as NewTek strangely refuses to allow third-party developers to access the Video Toaster framebuffers. So, keep an eye on OpalVision. It may be a very smart choice.

—Paulo de Andrade

TechnoSound Turbo v2.7

***Griffin Systems*, $99.99.**

All Amiga models.
External, parallel-port connection.
Installation: Easy.
Hard-drive installable software.
Not copy protected.
Not 2.0 compatible.
Accelerator compatible.
Minimum system: 512K of RAM.
Recommended system: 1MB+ of RAM, hard drive.

Eight-bit sampling and editing.

TechnoSound Turbo is yet another eight-bit sampler from the European Amiga community. While it shares many features and much of the look of this audio wave lapping our shores, it does present a few twists of its own.

A hardware/software combination, TechnoSound Turbo comes with both an audio sampler and editing software to manipulate your samples. The sampling cartridge is about the size of a pack of cigarettes, plugs into the parallel port, and has two RCA phono jacks for connecting to your stereo system or other sound source. The package also comes with a cable that links the cartridge directly to the headphone jack of a Walkman-type device. You'll need an adapter, however, to use a microphone. There is no pass through, so you'll be swapping cables to use your printer.

The screen is laid out in a manner similar to most sample editors. The top half of the screen represents the waveform, while the bottom half displays twin oscilloscopes and an array of buttons that control recording, editing, and effects-processing features. The buttons on the left handle such functions as recording, playback, and zooming in on the waveform, while the buttons on the right bring up submenus for editing, disk access, and the like.

Cool Special FX

TechnoSound Turbo sparkles when it comes to the special effects and the loop functions, in particular. As with most sample editors, TechnoSound Turbo lets you process previously recorded samples through a variety of echo and reverb effects, in addition to adding real-time effects to your sample as it is recorded. Real Time Edit puts your sample into an infinite loop, letting you adjust it on the fly. (You'll be able to spook the neighbor's cat by processing your voice through the Voice Synthesis and Dalek synth effects.)

Editing features can also create unusual effects. Use the Mix to create r-r-rap stutters, or flip any portion of the sample around with Flip. User Echo lets you define your own echo parameters, setting the delays and relative volume levels for each of the four Amiga audio channels. You'll have all the control you want over your samples with TechnoSound Turbo.

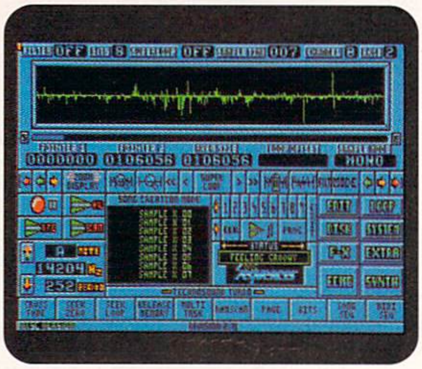
You can link your samples into songs, using TechnoSound Turbo's Song Sequencer. The process is similar to linking verse and chorus sections in a MIDI sequencer to compile a song. While not meant to compete with music-creation software, the Song Sequencer can produce a nice string of special effects or even a looping music-and-sound-effects bed for a title screen or short animation. The MIDI Sequencer feature allows you to trigger samples from a MIDI keyboard or from your Amiga keyboard. Unfortunately, I have not been able to get this feature to function on TechnoSound Turbo or any of the other European sampler editors I've looked at, either from a MIDI keyboard or from the Amiga keyboard.

Hammer Time

There is much to like in TechnoSound Turbo. It performs basic editing and recording functions adequately without a lot of hassle. As with all things, however, it could stand a bit of polishing and refinement. TechnoSound Turbo gave my A3000 all sorts of trouble. As a matter of fact, version 2.7 of the program didn't want to function under 2.04 at all, although it performed just fine on both my A3000 and A500 under 1.3. Oddly, the demo version I received did work under 2.04.

Pointer positioning could be improved, as well, and the scrolling bar didn't always display. Both pointers were offset to the right by about an inch under 2.04 on my A3000. All scrolling controls could use a fine-tuning option. Every arrow or button used for changing pointer locations, sample rate, and so on scurried so quickly that it was rather difficult to make a selection with any degree of accuracy.

TechnoSound Turbo hogs the system resources and multitasks grudgingly at best. You must manually type in your path if your program and files are not on floppies or in your dh0: partition. The requester windows are similar to those in other European samplers, and hence are nonstandard by domestic reckoning, and take a bit of getting used to. You can only quit the program from the disk submenu.



Link your samples into songs with TechnoSound Turbo's Song Sequencer.

As with many sampling products, TechnoSound Turbo could use an Undo button. If you process your sample through an effect and are unhappy with the results, you must reload the sample from disk. If you didn't save your sample to disk first, well, you'll have to start all over.

If you want to dip your toe into audio sampling, TechnoSound Turbo is a reasonable starting point. The editing, looping, and effects are first rate, and the pricing and interface put it in the hunt for your sampling dollars. Even though there isn't enough in TechnoSound Turbo to place it unquestionably above all other similar products, it certainly offers enough to be worthy of your serious consideration.

—Rick Manasa

MorphPlus

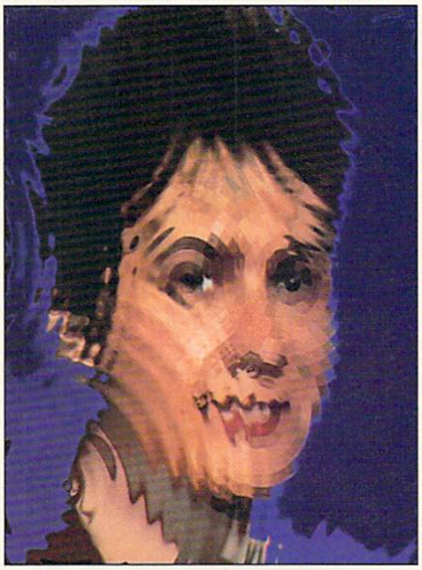
ASDG, $295.

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: AmigaDOS 2.0, 4MB of RAM.
Recommended system: 2.0, 8MB of RAM, hard drive, accelerator.

Special effects, image processing and animation

The best wave to come along in several years for animators and graphics professionals is the morph. Transforming people to animals, animals to machines, and machines to people is big business in the video world. Unfortunately, the price of the required software has been equally big, too . . . until now. For $295, MorphPlus gives you morphing and more—perspective transformations, perfect rotations, rippling bitmaps, and other wild pixel twisters that make producing jaw-dropping effects easy.

MorphPlus is not one program, but three separate ones. The first is Morph, where you set up the actual animated sequence. The main program, MorphPlus, renders the sequence from Morph's parameters. Finally, FRED (FRame EDitor) processes entire animations. MorphPlus runs on its own, but both FRED and Morph require that MorphPlus run in the background at the same time. The look and feel of the main interface is similar to ASDG's Art Department Professional, with 3-D-style buttons and gas-gauge meters that give feedback on a job's progress.



MorphPlus offers more than morphing, as this ripple effect demonstrates.

Head to Head, Face to Face

Morphing is a complex process, but MorphPlus makes it easy. After starting MorphPlus and Morph, you open a new project and specify the source (morph from) and destination (morph to) images. Central to the main Morph screen is a large image area where the source and destination images are shown as gray-scale pictures superimposed on each other. The effect is similar to that of an onion skin or light table, where one image shows through the other. You have total control over the amount of transparency, brightness, and contrast of each image. If a picture detail is tough to distinguish at first, you can usually make it stand out clearly by adjusting the contrast sliders.

Two simultaneous effects combine to make a successful morph. The first is a cross dissolve in which the source picture fades out as the destination picture fades in. In the second, more crucial aspect, parts of the source picture move to match ►

the location of corresponding parts in the destination picture. MorphPlus gives you superb control over both facets.

The most time-consuming portion of creating a morph is getting all those parts from one area to another and defining the motion paths. Consider morphing one face into another. The outside of the head, eyes, nose, and mouth must be animated over the duration of the morph. For a more detailed look, you can move the top and bottom of lips, eyebrows, eyelids, hairlines, and other features over time. This easily adds up to quite a task. MorphPlus attempts to make this difficult process easy, and includes an arsenal of tools to help with the animation.

You define the animated portion of the move with a series of lines, called vectors. They contain the start point, direction, and end point of the move. Vectors can animate in any direction and can be grouped and named for easy access. If the work area gets crowded, you can turn groups off and on. You can also cut, copy, paste, erase, and flip them. For example, you could animate a face's left eye group, then copy and flip it over for use as the right eye.

The vectors move and push the image along with it from the beginning position to the final position. Each vector can even move at a different speed, if you like. For example, the eye vectors could change quickly, while the mouth vectors move slowly. You can modify vector speed on a graph and set the location for each frame, or you can define the speed on a user-designed straight or spline path.

If you think all this sounds cumbersome, you're right; it can be. Lots of files are generated during the creation of the morph. Luckily, MorphPlus keeps track of all the housekeeping through the use of projects. A project contains all the vectors, pictures, and other elements that MorphPlus needs to perform the morph. You concentrate on the anima-tion; MorphPlus handles the files. Even better, MorphPlus is completely configurable, so creating a custom environment is a snap.

Shout About Twists

If morphing isn't your style, MorphPlus is still worth having for all the other clever tricks it can perform. Pictures can be warped, wrapped on spheres, moved in perspective, twirled, and rippled. Even better, you can animate any of these effects.

For example, the ripple effect is particularly interesting. Imagine having a picture made of water into which a stone is dropped, creating waves that emanate from the impact point. The ripple effect emulates this and more. You can specify multiple waves coming from different points (even off the picture's side). The waves can collide with each other and set up new wavelets. You have complete control over the number of waves, starting points, wave heights, speed, and duration. Waves can increase, decrease, or stay constant over time.

In the fine ASDG fashion, the manual is excellent. The tutorials are easy and fun, helping you along the learning curve very quickly. Every function's keyboard equivalent is discussed, as is the ARexx port.

There are a couple of gotchas. MorphPlus needs to have plenty of memory in big contiguous blocks, especially when working with 24-bit images. The onionskin view works fine, but seeing both pictures side by side would save lots of sliding back and forth through transparency levels.

Staying Power

Despite these minor points, MorphPlus is an excellent package. It has a huge range of capabilities—much more than just morphing. The other tools are just as impressive and lots of fun to play with. Even if the morph craze fades away, you'll be more than ready to tackle new markets with MorphPlus.

—Derek Grime

Touchdown 100

New Horizons, **$650**

A2000, A3000.
External, SCSI connection.
Installation: Easy

250-megabyte SCSI streaming-tape drive for hard-drive backup.

Thanks to the ever increasing size of Amiga graphic and animation files, large hard drives—some of them weighing in at more than 120 megabytes—are becoming less of a luxury and more of a necessity for professional Amiga users. While jumbo hard drives can solve large data-storage problems, they can simultaneously turn the often tedious task of backing up data into a painfully time-consuming ordeal.

A 40MB hard drive can be backed up in less than an hour; a 300MB drive may take an entire afternoon. Therefore, understandably, an increasing number of Amiga users are dumping their floppies and moving to more effective solutions for hard-drive backups. One of the most popular alternatives to a stack of floppy drives is to use a tape drive, such as New Horizons' new Touchdown 100 ($650), a 250-meg SCSI streaming-tape drive.

Easy Addition

The Touchdown 100 is an external unit, about the size and weight of two stacked textbooks (9×10×3 inches). A 12-page manual, a power cord, and a 25-pin to 50-pin SCSI cable complete the package contents. Strangely, the drive doesn't ship with a blank data cartridge; you must purchase it separately. Because the Touchdown 100 is compatible with two of the most popular quarter-inch tape-cartridge formats—DC-6150 and DC-6250—finding blanks should not be a problem. I managed to locate a 150MB DC-6150 cartridge at a local office-supply store for around $25; the larger 250MB DC-6250 models run about $30.

Because the Touchdown 100 is a SCSI device, connecting it to an Amiga equipped with a SCSI interface is a plug-and-play operation. Touchdown 100 is a "terminated" SCSI device, meaning that it must be situated at the end of a chain of SCSI devices. If you have any other peripherals—such as an external hard drive or CD-ROM device—you'll need to connect them between the Touchdown 100 and your Amiga's SCSI interface.

Installing the Touchdown 100 isn't difficult; after plugging the SCSI cable into your Amiga's SCSI port, connecting the power cable, and inserting a blank cartridge, you're ready to begin backing up your hard drive with your favorite software. The tape drive is covered by a 90-day warranty should disaster strike. New Horizons' telephone support is excellent, although a technical-support number is noticeably absent from the installation instructions. (If you need it, it's 512/328-6650.)

Stuck on Tape

So how well does the Touchdown 100 work? Over a period of several weeks I performed a number of backups and restores teaming the Touchdown 100 with a variety of Amiga hard-drive back-up utilities. Using New Horizons' own back-up utility—QuarterBack 5.0—it took a fraction over 60 seconds to back up my 4.4MB System2.0: partition, for example.

I'm pleased to report that from tiny partitions to entire hard drives, the Touchdown 100 streaming-tape drive —based upon a Caliper CP150 drive mechanism—performed without a hitch. Aside from somewhat skimpy documentation and the lack of a blank back-up cartridge, the Touchdown 100 is a first-rate mass-storage solution.

—Jeff James ■

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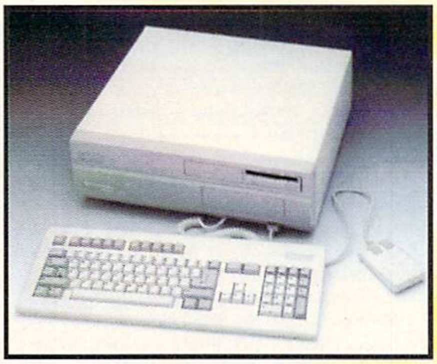
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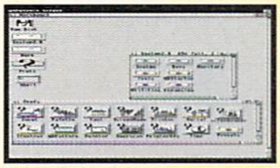
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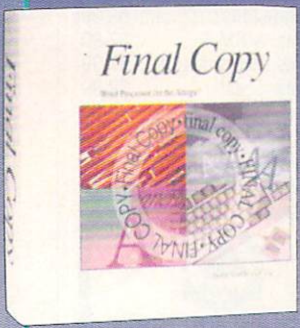
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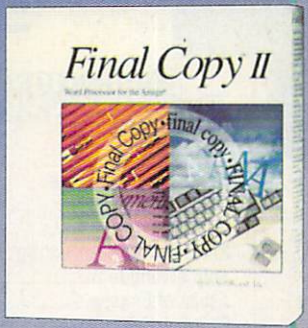
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The Game Preserve

LURE OF THE TEMPTRESS

By Peter Olafson



Will the Lure of the Temptress overpower you?

BY NOW, MOST of you will have heard that Sierra has abandoned the Amiga market—at least for the time being—leaving incomplete the conversion of EcoQuest and 32-color versions of Police Quest and Quest for Glory. The company cited poor reception for its games. Small surprise: They began to pay heed to the state of the art in Amiga adventures only toward the end.

That standard is high and getting higher. The animated adventure is in the throes of a renaissance, and Sierra's absence is likely only to raise the industry's batting average. An Amiga version of Virgin's gorgeous Legend of Kyrandia is just out as I write this. LucasArts' Indiana Jones and the Fate of Atlantis and Core Design's Curse of Enchantia and Darkmere are around the corner. Right now we have Lure of the Temptress (Konami, $49.95), which, I'm happy to report, is an absolutely splendid example of the craft.

It's from an outfit called Revolution Software from England—where Lure was originally published by Virgin—that is practicing a pleasant form of magic called Virtual Theater. The premise: A character isn't simply a sprite that's turned off when he leaves the room, but a little computer person who exists within the game independent of the presence of your character. These nonplayer characters aren't automatons waiting for you to interact with them; they have lives, agendas, and schedules. If a character is not where you are, he can be found somewhere else.

The game itself can perhaps be best described as a hybrid of a LucasArts adventure—it has the same ease of play, and your character has a friendly trace of Guybrush Threepwood about him—and a game from Delphine's Cinemathique line. No icons here, though; if you want to investigate an object or person, you simply click on it and a menu of the relevant actions pops up.

Yes, it's the same old, tired beat-the-evil-wizard story, only this time the wizard is an apprentice sorcerer named Selena, who's behind an uprising in the community of Turnvale. And yes, it's essentially another Object Quest, although I have to say that once the game really gets underway, it doesn't feel like one. LOTT's dynamic is a curious one; at times it's pure Mon-

Continued on p. 95.

CRIB NOTES By Peter Olafson

After two month's worth of cheats, I can't resist delaying our adventures in Ultima VI: The False Prophet (*Origin*, $69.95) with just a couple more.

There's an extensive editor built into the program—a little Ultima construction kit, in some respects—and with a bit of work it's possible to retile the landscape to your liking. (Thanks to Anthony W. Wilson of Shelton, Washington, for his tips.)

One big fat caveat first: Use this cheat at your own risk. If you care at all about your progress in the game and the integrity of your disks, use only backups. I'm not clear at all on what some aspects do—this cheat cries out for detailed documentation—and correspondents tell me it's possible to crash the program and permanently change the shape of Britannia with some elements. So watch your step, and for heaven's sake, don't save afterward, eh? (And if you do, please don't tell me about it.)

You can invoke it anywhere. Simply start up a conversation with Iolo and say spam, spam, spam, humbug, with a carriage return (but no comma) after each word. (Evidently the programmer was a Monty Python/A Christmas Carol fan. Or maybe he just liked spam.) For each spam, he'll tell you to talk to Shamino about it—the typical Ultima VI way of saying "dunno"—but just persevere, and you'll be rewarded with a five-item Secret Cheaters Menu: Get Items, Set Flags, View NPCs, Edit Party and Edit Player. You're in. (You can get out now by just pressing Return.)

We'll start at the bottom with the cheat to display karma—the game's otherwise invisible measurement of your goody-goodness or baditude—that I promised last fall. Use Edit Player to see, raise (up to around 32,000), or lower your current reading and to set a quest flag. There are ten flag settings, from 0 to 9, and I couldn't tell you what any of them mean, except that they evidently determine whether or not you're on a holy quest.

Edit Party offers a more traditional stat editor. You can increase any party member's strength, intelligence, dexterity (up to the maximum of 30), level (up to 252, although hit points max out at 255), and experience (a max of 99990); restore a living character to full health; and even get a horse. (It appears on the spot.)

View NPCs is essentially a little encyclopedia of the 187 nonplayer characters in the game. You can study their portraits, search for who's carrying a particular item,

Continued on p. 95.

To locate vendors of the games reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 114.

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From p. 92.

key Island, at others it's almost like role playing, and the command structure is more like that of a text adventure. Yet, they all fit together somehow.

You're a plain fellow named Diermot who's swept up in the king's sortie to put down the revolt, and in the melee that ensues, you're knocked cold only to wake up in a cell. Once free—you'll need to create a diversion here—you'll hear a dying man's vague report of a girl in danger, and it's off to Turnvale proper in search of a blacksmith.

It's not as large as a Monkey Island II—LOTT comes on just four disks—but it's much deeper than you'd expect, and its space is used more intensively. You can give your pal Ratpouch complex, multipart instructions. You can peer in windows (for instance, to listen to the murderous imprecations of the guard you'll have to trap at the outset), talk to lots of people about everything under the sun, and fight with a few. That takes some practice, as the system's a bit arcane.

LOTT confesses its only venial sins right on the product info sticker: hard disk not supported, on-disk copy protection, off-disk copy protection. Not taking any chances, eh? These combine to make Lure something of an experience in waiting for an I/O error, and I wish Konami had done a bit more than convert the game to NTSC, recast the manual for US consumption, and slap its name on the box. Even Sierra's worst stuff went on hard disk, for goodness sake. (It won't run on the A3000, either.)

Overall, the play's the thing, not the technical specs, and on those terms, Lure will do. In fact, it will do just fine. Sierra who? ►

CRIB NOTES

From p. 92.

and, in theory, be able to see what each is carrying, although I couldn't get this to work correctly. Finally, there's a little item here called Set Worktype. Logic suggests this is a way to edit NPC jobs, but it also has a bit of programmer-ese about it and my machine quietly locked up when I tried it on my Avatar. Maybe I should have turned Iolo into a locksmith.

Set Flags? Lets run it up the flagpole and see if the Amiga crashes. Use with caution. I really haven't a clue what it does. Flags are typically used in adventure games to identify for the program whether, for instance, a given area has a light source or a door is open or closed. Here, there are eight of them for each NPC—set to either 0 or 1.

Get Item is the neatest one, in a sense, because it's an education in how the game was created. This allows you to add to your inventory up to 144 of any of the 452 items in the game. What, your character can't haul 144 chain coifs around? The program doesn't care. It gives them to you anyway, ya big lug. And because these items include tiles of scenery, people, and beasts, you can deposit them all over in place of the existing scenery. Fool your friends! Fun at parties! (However, it's not a true editor, as the program treats them as background, and you can't interact with them in any way.) The first one I picked out was a horse's patootie, and I proceeded to decorate every available inch of Lord British's kitchen with horse patooties. Very attractive it was, too.

Even the intro has a cheat. Try pushing the number keys 1 to 7 in the opening scene with the TV. They switch channels on the set. Not a biggie, but a nice way to see all of each commercial. The Avatar has the attention span of a three-year-old, and is apt to turn 'em off before they're over.

The IBM version has still another—the equivalent of which I haven't been able to find on the Amiga. If you push Alt-2, 1, 3, you're rewarded with the party's location and other info. Drop me a line if you've got this one scoped out.

Next month: Crib Notes goes legit (again) and takes a look at some of the darker spots in the game. Then we'll move on to Lure of the Temptress (*Konami*).

Campaign

By Rob Hays

IF YOU HAD been in charge of the German defenses on D-Day, could you have repulsed Eisenhower's offensive? Campaign (Empire Software / ReadySoft, $59.95) lets you try your hand at reshaping history in this and 24 other battle scenarios.

While most war games lock you into either strategic have-your-battalions-capture-Poland or tactical drive-your-tank-to-the-town-and-shoot-the-other-tanks play, Campaign gives you both challenges. The larger scenarios concentrate on the strategic aspects of warfare, requiring planning and decisions



They're cannon fodder in your sights . . . you hope.

to coordinate movements of large forces. (Should you call in air support, or move your artillery up?)

When you make contact with the enemy, you can take tactical command of the forces or allow the computer to determine the winner. If you decide to fight yourself, you choose which vehicle to control and again can allow the computer to control various aspects of the fight. For example, if you are in a tank, you can leave the strategy and driving to the computer and concentrate on tracking targets and firing the gun, or any combination of the activities.

In addition to strategic and tactical concerns, you have to think about reinforcements and supplies. Most scenarios include factories whose output can be modified to suit your needs. Lose a lot of tanks in battle? Switch a factory from truck to tank production. But don't let the enemy close your supply lines, or those convoys of replacements won't be able to get to the front lines.

Campaign is almost entirely mouse controlled, the exception being the keyboard-controlled tactical battle sequences. The speed of the game clock can be varied to suit different circumstances. The game can be paused or saved at any time, and runs under 2.04 and upon an A3000. You can install it on a hard disk, and although there is no script provided, the instructions are plain and simple to type in with the CLI or Shell. Included in the program is an editor that lets you modify any of the existing scenarios to create your own.

A bound 78-page user guide includes a short history of WWII and walks you through a tutorial battle. A 169-page book has detailed information on all of the equipment available in the game, and is the basis of the copy protection. The protection kicks in not only at the start of a game, but also whenever you want to save a game in progress. A nice extra touch is the ►

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reproduction propaganda posters and newspapers included in the box.

In all, this is an engaging game, striking a fine balance between strategic and tactical action.

A Compendium of Compilations

By Peter Olafson

THOSE NICE FOLKS in marketing, God love them, are still trying to do your Christmas shopping for you. Every year, right around Halloween, games compilations begin piling up in the stores. Sometimes they offer something new, stirred in with something you already have, to tempt your wallet. And sometimes they're just the same old thing in a new hat and shoes. This month, we'll look at examples of both.

Harpoon Challenger Pak, Signature Edition

Harpoon Challenger Pak, Signature Edition (Three-Sixty, $79.95) is the computer-game equivalent of the coffee-table book. It's big as a house, it looks nice in festively decorated paper, it rattles ominously when shaken . . . and if you are a big fan of this excellent-if-ponderous wargame, you probably don't need it.

This is the complete Harpoon. It consists of the main program, the original GIUK battleset, three add-ons (NACV, MEDC, and IOPG), and the scenario editor. The only thing even semi-new here is version 1.1 of Harpoon itself—said to be the final Amiga version—but you can easily obtain that separately as an upgrade from Three-Sixty. The embossed signatures of the designers are not exactly a selling point. The company didn't even put in the Harpoon Battle Book.

If, on the other hand, you're not a Harpoon addict already, this is something of a bargain—the usual "if purchased separately, you would spend . . ." story—and a nice, thorough-going way to make the acquaintance. Harpoon is, to put it kindly, ponderous on slower machines—it's sort of like playing a real-time wargame—but it remains the best tactical-level game of modern naval and air combat around: lots of nail-biting realism, easy-to-master controls, and reams of information on the various armaments.

Combat Classics

For a season dedicated to peace on earth, goodwill to men, and all that, we're certainly getting a lot of wargames. Combat Classics (Empire / ReadySoft, $59.95) brings together Electronic Arts' submarine game 688 Attack Sub, MicroProse's flight sim F-15 Strike Eagle II, Empire's own Team Yankee, and a whole family of spiders.

Just kidding about the spiders, but only a little. 688 is around four years old. It wasn't bad in its day, but it doesn't support modem play. MicroProse's F-15 II took some critical heat for being too much of a shoot-'em-up, but it's very speedy and detailed on a plain-vanilla A500, and I happen to like shooting down lots of enemy planes. And Team Yankee is still a tough little nut of a tank game, with simultaneous views from each of your four units. CC seems a little pricey overall but is a solid package. (Nice games, too.)

Big Box 2

If you want a really big reissue compilation, you'll have to go to Europe. Beau Jolly's Big Box 2 ($40, varies) contains no fewer than ten games: Back to the Future 3, The Real Ghostbusters, R-Type, Sinbad and the Throne of the Falcon, Arma-

Continued on p. 102.

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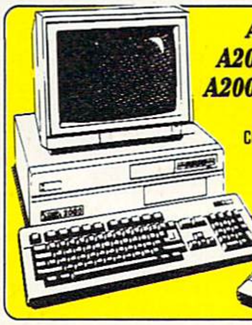
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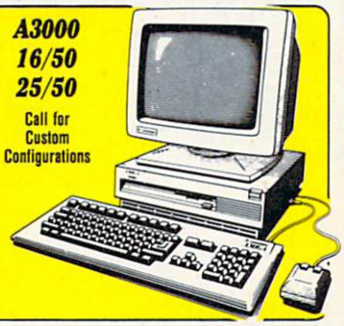
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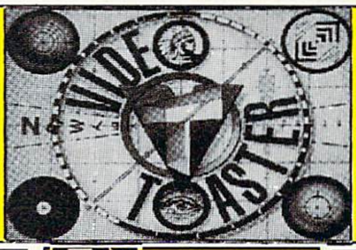
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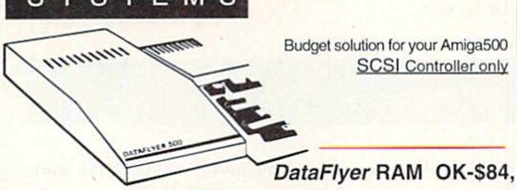


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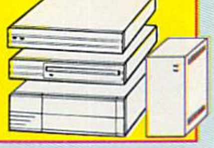


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lyte, Defenders of the Earth, Shanghai, Bombuzal, TV Sports Football, and International Karate Plus. Jeez Louise. None are quite new, but there are a few classics in the bunch—Cinemaware's Sinbad and Activision's Shanghai in particular—and at about $5 a pop, you won't do any better.

TENGEN'S ARCADE HITS

By contrast, Tengen's Arcade Hits (Domark, $39.95) surfaced well before Christmas, and it is exactly the kind of compilation we need: five primo-to-decent European-made arcade games—all conversions from Atari arcade machines—from the late '80s and early '90s, none of which saw domestic issue. We'll take it from the top. Escape from the Planet of Robot Monsters alone is almost worth the price of admission. This is a near perfect rendition of Atari's isometric arcade game. You control a little fellow who runs around turning on escalators, destroying machines, blasting robots who look like popsicles with a bad attitude, and just enjoying the game's genial weirdness and technical smarts. Hours later you discover it is 3AM.

It would have been hard to go wrong with Klax, and Domark didn't. It's a creative, addictive turn on the Tetris theme: colored rectangular pieces on a series of conveyor belts rolling toward a hopper that you use to drop them in various configurations. Hard Drivin' II: Drive Harder has gotten only so-so press abroad, but I liked it: four tracks, a track editor, graphics that pleasantly approximate the original sit-down arcade game, and better speed than I'd been given to understand. I do wish you could pop from the editor to the driving game without rebooting, and control remains a weak point, but this really isn't bad.

The other two "hits" are, alas, more like near misses. All-Points Bulletin shouldn't be one of them; it's a delightfully detailed police game—the buildings beside the streets loom up in three splendid dimensions—and the animation when you lose is a riot. But its screens are oddly murky, and it hasn't been compressed onto the smaller NTSC screen from the original PAL version, so your car is out of sight at the bottom of the screen.

Finally, there's Toobin', which has you paddling downriver in a frail inner tube. It's a pedestrian conversion that makes all the correct sounds and moves, yet somehow lacks the Lotus Land quirkiness of the arcade original and has the brittle, conversion-by-numbers feel of games like 1945. Toobin' just doesn't float.

Do note that all five games were designed for pre-A3000 era machines and that some may cause later models to spew and rhumba uncontrollably. If you have an A500 or A2000, however, you're in business.

SHORT TAKES By Peter Olafson



FIGHTER DUEL PRO

The best Amiga-specific flight simulator since F/A-18 Interceptor just got better. Fighter Duel Pro ($59.95) is, in a sense, the real version of Jaeger Software's earlier Fighter Duel. It's not quite as charmingly homemade as the original, but has all the little perks you'd demand of the big boys: lots of additional planes, two computer opponents, variable difficulty levels, and the option (with a bit of extra hardware) to use a second machine for a rear view. I had a bit of trouble getting it going from hard disk on a 512K chip RAM machine, but it still makes flying feel like ice skating.

PLAN 9 FROM OUTER SPACE

Plan 9 from Outer Space ($39.95) is not one of Konami's better European acquisitions, I'm afraid. The idea for this graphic adventure from England's Gremlin is kind of cute—recovering bits of the awful movie of the same title—and there's some good spot animation during play. The reality is rather ugly: The style of play is antique, and I couldn't get any of the three copies Konami sent me to install on hard disk without getting I/O errors at the tail end of Disk 2. With four game disks, this is sort of a drag. OK, we've seen Plan 9. What's Plan B?

UTOPIA

Pure gold. Utopia (Konami, $49.95) is a superb synthesis of two great concepts: SimCity's community management and PowerMonger's game of conquest. You're charged with establishing and defending an off-world colony. Initially, this just means laying out various task-specific buildings—from a nice bank-camera perspective—and trying to make colony folk happy. But at length, aliens begin to turn up on your lawn and you can bet they're not from Welcome Wagon. Right then you'll begin to appreciate the real depth of Utopia—that this rather still and empty-seeming city has a life below the surface, that weapons factories put out product, that your researchers can invent improvements. Add this to the Best of '92 list, would ya?

DATA DISKS REDUX

By and large, a data disk is only as good as its parent game, and both of this month's entries live up to their parents' high standards. Battle Isle Scenario Disk, Volume One (UBI Soft, $49.95) is for the three or four of you who have struggled through this excellent and challenging futuristic wargame, with 34 new maps (nine for the two-player mode). It's not just more of the same, either; there are new terrain types (desert, arctic, rivers, and coastal waters) and consequently new unit abilities and limits. You'll be busy through high summer. Any chance of a map editor, UBI?

Then there's Operation Sledgehammer (Three-Sixty, $39.95)—the first of two mission disks for Megafortress. It postulates the rise of military strongman in Iran—one supplied by Libya—and you'll be taking your ►

MORE SHORT TAKES

vibed-up B-52 on a little (25-mission) sightseeing tour over those two countries, with some new weapons on board and firing at you. All very nice, too, but the real key is that Sledgehammer preserves the game's unique status as a flight sim/strategy hybrid. Nice work, and a solid addition to the Megafortress line.

SOLITAIRE'S JOURNEY

You know how most card games are: little multitasking time-killers for downloading, object-rendering, and spell-checking. You play, you lose, and you're done. Well, you can get rid of that idea right now. Solitaire's Journey (Quantum Quality Productions, $59.95) weaves 105 solitaire games—from Agnes Bernauer to Mount Olympus to Yukon—into cross-country trips, house hunts, and tournaments. And who'd a thunk it? It's a great game, with all the rules available on line and options up the wazoo. Plus, it installs snugly on a hard drive. In fact, think I'll nip away right now and do some, uh, spell-checking.

DEUTEROS AND PALADIN II

We have a nice pair of sequels here: one unfashionably early, the other unaccountably late. It can take a couple of years for a followup game to reach market. Deuteros (Activision, 39.95) has beaten that mark by virtue of Paragon's thoughtful import of Millenium last year. Folks who thought they'd happened on a great new game—in fact, Millenium 2.2 was released abroad a good bit earlier—now can have the satisfaction of playing its descendant *now*. This elaborate, atmospheric game of resource management—set a thousand years after its predecessor—is even more complex, not to mention better looking and better sounding, and there's just the right amount of stuff going on simultaneously, so you're never at a loss for something to do. Quibble: It's been inadequately compressed from the PAL version, and you may find yourself peering down the cowl of your monitor for the missing portion of screen.

The latecomer is Paladin II (Impressions, $59.95). It's essentially a prettier version of 1988's Paladin—i.e., a tactical wargame in the style of Breach 2, but with a medieval ethos and swords instead of lasers. And mainly the news is good. The graphics (32 colors, from all appearances) are topnotch—the quests you perform really look like little games now—the animation and sound fine, and the built- in construction set is still versatile and easy-to-use.

I don't detect scads of extra features here, which isn't necessarily a disadvantage. (Paladin's very straight-forwardness was part of its appeal.) But the game is slow on a 68000-based machine when loading anything larger than a new palette and the hard-disk installation routine is its own little slice of chaos. Look, folks, just use CBM's own routine. At least it has the advantage of working.

DISCOVERY: IN THE STEPS OF COLUMBUS

Discovery ($59.95) actually follows in the steps of Impressions' earlier Merchant Colony—a mundane trade/conquest game for which I professed a less than deep and abiding affection a few issues back.

They got it right this time; this is a comparatively involving game of exploration and colony-building. It plays more intuitively (though a tad more slowly, and with control still arcane in some areas); is full of thoughtful features; and there's simply more to do and more fun to have doing it. (Love all the buildings you can erect in port.)

I did have the sense now and then that I was playing in a computer- inhabited vacuum, and an option for multiple human players would have been nice. But Discovery: In the Steps of Columbus is a step up. Not great, but solid stuff.

CYBER EMPIRES

SSI is whittling its roster of Amiga ports down to nothing; Spelljammer and Great Naval Battles have joined Dark Sun on the list of cancellations, and Matrix Cubed is looking iffy. However, at the same time, it seems to be stepping up its imports from Europe. (Huzzah!) This enjoyable and detailed amalgam of strategy, arcade, and wargame elements—a five-way battle for the heart and mind of the planet Orion —is one of them. (Over There, it's a Millenium game called Steel Empire; here it costs $49.95.)

I like it. It's slick and smooth, and there's a little something for everyone—tactical combat is handled in arcade mode—and despite being something of a stylistic hodge-podge, everything seems to works well with everything else. Anything else in that black bag, SSI?

LOTUS III

If Core Design hadn't released Jaguar XJ220, I'd probably be gibbering and drooling over how this third entry in Gremlin Graphics' Lotus series was a knockout blow in Europe's car war to build a better Outrun. As it is, this is quite good—and runs like a demon on the A3000—but also compares to Jaguar quite closely, both in terms of speed and features. I'll give a slight edge to Jaguar for realism. Can't stand those checkberboard roadways in Lotus III (about $40). What is this, Space Harrier? ►

STILL MORE SHORT TAKES: PD AND SHAREWARE

If a software company doesn't make a game for the Amiga, make it yourself. That seems to be the prevailing dictum behind this crop of PD and shareware clones and copies.

The Mad Bomber, Jungle Search, and Qube Hopper are Amiga renditions of the venerable 8-bit games Kaboom!, Pitfall, and Q-Bert, respectively.

They're not ooo-gotta-get-it great, but they look better than the originals, play substantially the same, and the only real weaknesses—aside from jerkiness in spots on the first two—are those of limited playability, which were inherent in the originals. Qube Hopper even comes with a level editor. (These three are shareware. You can get them from the Amiga Arts games library on CompuServe.)

Donkey Kong, on the other hand, isn't a clone but an almost flawless, note-for-note copy of the primal jumping-climbing-and-running game, with an alleged added level to boot. To date, I've seen it only on DevWare's FD 81. (I've heard there's also an Amiga version of Muse's Castle Wolfenstein in this same school.)

Then there's Sonic the Hedgehog. Long have there been rumors and wishes on the nets that Sega's trademark Genesis character would make it to the Amiga in some form (the little blue guy's speed would translate perfectly) and it seems to be happening. This is only an automated demo—quite a good replica, too, in both speed and style —but the scrolling text describes it as a "game preview," so something more may be in the works. Stay tuned. (This one is available via certain FTP sites on Usenet.)

Now, if only I could talk someone into making PD versions of M.U.L.E. and Miner 2049er. □

—PO

AMIGA WORLD Tool Chest

The AmigaWorld ToolChest, a quality line of low-cost software, presents powertools for your Amiga. By purchasing this software you receive unmatched versatility, usability, and best of all, you support the independent Amiga developer. The "TSP" disk series are collectively grouped by theme for your easy access. The "RK" anthology are registered versions of the cream of the crop in shareware titles. The "TC" line, our premium disk series, is also conveniently available in our money-saving subscription offer.

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P48AB: The A-64 Package This is a complete Commodore 64 emulator. ulates saphics...everything (no fast loaders or timing-sensitive software.) Works on y Amiga with 1 meg. Two disks, counts as two.

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P45: AmigaDOS Replacement Project (ARP) This is the result of a very bitous project to completely replace all of the AmigaDOS c: commands (DIR, LIST, SIGN, INFO, etc.)with more powerful, feature-filled programs. These programs are ly compatable with their Workbench 1.3 counterparts, but also offer many more pabilities--including greatly enhancd wildcard support and more help for each com- nd.

P44: MechFite is a role playing game where you control a giant robot and explore rlds, buy or find items, fight against other robots and aliens you are also required to ill some tasnd complete missions.

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P39AB: Catacomb A well done graphic dungeon adventure game. Discover the crets & treasures of the uderground maze and try to stay alive!

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P37: CheckBook Accountant This program has full budgeting/transaction record- capabilities. This program turns the chore of balancing your checkbook into a 2 nute treat!

P36: Animation Two beautiful animations, Spigot and Watch. Both of these were eated with 3D animation programs and are truly beautiful and smooth.

P35: HackLite This is a dungeon-adventure game of the highest magnitude...an solutely huge world to explore that will task even the most hardened dungeon plorer for weeks on end!

P34: MechForce Any number of players can control up to 24 giant robots with ers, missiles, jump-jets to get you airborne to do battle in teams against each other against the computer...*highly* addicting!

P33ABCD: Complete Guide to Programming the Amiga in "C" This four disk t features tutorials, sample programs and inside tips to the special programming eds of the Amiga. Four disks counts as three.

P32: Classic Arcade Games Defender and Missile Command--need we say ore? Descender is a clone of the classic Tempest.

P31: DataBases Contains all flavors of databases. BBaseII is a highly Amiga- ed database, DataEasy is another powerful database. MagMan is specially signed to help you reference articles in magazines.

P30: Educational This includes WorldDataBase, DrawMap--which draws detailed aps of countries. WordGame, Metric Converter, Spell2--an ingenious spelling chal- nger, FastFacts--everything you always wanted to know about our Solar System.

P29ABC: King James Bible The complete text of the bible is included on this 3 k set (counts as 3) with printing and searching capabilities.

P28: Bitmapped Fonts This disk contains 67 fonts for the Amiga, all under 25 ints in size...a font for every occasion!

P27: Octa-MED This remarkable program doubles the sound capabilities of your iga from 4 channels of audio to 8! Almost completely identical to MED, this is a ly remarkable program.

P26: Directory Utilities Contains all of the best public domain and shareware file d disk utilities available for the Amiga, including UtilMaster, FileMan, M2DU, Sid and Master.

P25: SpaceGames Contains MoonBase a very graphically detailed lunar-lander me, SpaceWar-a two player (either in person or over the modem) space battle. bula is a 3D world you must defend..definitely commercial quality.

P24: Printing Utilities This disk contains a very nice Banner maker that will use y AmigaDOS font with full-color printing. RobsLabelCreator will allow easy creating labels for your diskettes. PrintStudio allows easy printing of text/graphic images with al control over page numbering/titling, etc.

P23AB: Tobias Star Trek A graphic space adventure where you're the captain of ur own starship. Travel through the universe, stop the Romulans and Klingons and mplete your missions. Two disks, counts as two.



The Intrepid featured on TSP43

P22: 3D Objects This disk contains 18 different vector-objects for use with Sculpt d Imagine. *Some* of the objects include: train engine, synthesizer keyboard, Amiga 00, space station.

P21: Disk Duplicators This disk contains all the best utilities to backup diskettes. luded are XCopyIII and NIB which will backup copy-protect programs. Also ludes SuperDuper which is an incredibly fast AmigaDOS copier. Freecopy will *nove* copy protection from many popular commercial programs.

P20: Board Games Includes Checkers, Dominoes, Clue, Jeopard and Monopoly. ow away your dice and let your Amiga take care of the details...hours and hours of ily fun!

P19: PacMan Classics Contains Mazeman, Zonix and PacMan87--all great imple- ntations of the origional arcade classic.

P18: MS-DOS Emulation Contains PCTask and IBeM, two shareware IBM-MS s emulators for your Amiga. Also included are utilities to allow Amiga drives to d/write 720K format MS-DOS disks--Multidos and MSH.

P17: Printer Drivers This disk contains over 70 printer drivers for many popular nters.

P16: Telecommunication This disk contains two first-class modem programs, omm and Access. This disk is for the beginner or expert telecommunicator, featur- all the popular communication protocols, including X, Y and Z-Modem. NComm very advanced script capabilities for performing automated log-ins, downloads and oads.

P15: MED This disk contains the premier music package, MED (Musical EDitor). It allow you to use digitized sound samples as your instruments and use them in your n songs. Its tremendous editing power makes MED more of a musical word-proces- . An extremely well-done program. Many commercial software companies use this kage to create soundtracks for their entertainment programs.

P14: Plotters This disk contains several of the best mathematical plotting programs ilable for the Amiga. Includes AmigaPlot--a 3-dimensional mathematical function tter (pictured), Aplot2.0, and PlotXY

TSP13: Tetris Games This disk contains 6 flavors of the classic game "Tetris." Some have artificial intelligence, others a variety of play-styles/skill levels/number of players.

TSP12: ClipArt This disk contains several excellent bitmapped images for use in Desktop Publishing or similar programs.

TSP10: Fractals Scenery (pictured) will create realistic fractal landscapes. Genesis allows the creation of various landscapes with user-definable levels of complexity. Also included are various Mandelbrot generators, including TMandel, Mandel-Mountains and FracGen.

TSP9: Utilities #1 IconMeister—an Icon editor with a complete set of editing/painting tools. TJFormat—a disk formatting program that will format disks that AmigaDOS wont. ChartMaster—a graphing tool that allows you to generate and save different graphs in IFF format. Graph3D lets you visualize complex data in 3-D and save the results. StructGen lets you create gadgets, text, bitmaps and window structures and the program will automagically write the "C" source code for you. LabelMaker is a very easy to use, full featured label printer. DoublePrint fascilitates printing of text files on both sides of paper.

TSP8: Clipart Black & White and colorful clipart for a variety of needs including desk-top publishing/video. People, holiday related, school items, scrolls, food, monsters, fish, lobsters, symbols and lots more.

TSP7: 3D Vector Objects #2 Books, Early American telephone, barrels, gun, space-ships, lamps, trombone, bugle, skateboard, Lego-Rover, remote control, glider and air-plane. All objects in Sculpt format.

TSP6: 3D Vector Objects #1 Lamp, mirror, bed, chair, fire hydrant, lamp post, street lamp, street sign, traffic light, cannon, cannon supplies, rose, fork, spoon, knife and plate. All objects in Sculpt format.

TSP3: Games 1 Crystal Caverns is an adventure game with randomly generated worlds--you'll never trash the same world twice! Dot2Dot is an adaptation of the clas-sic 2-player connect-the-dot game. PizzaDeliveryMan has you running through the streets to get those pies to your customers. TinyBall is the world's smallest baseball game. Surround-Cycles is a high-speed arcade game, based on the light cycle races from the Disney movie Tron.

TSP2: Sounds Animal sounds, musical instruments and many, many more—43 sound samples in all!

TSP1: Maps of USA, Canada and Europe Hi-Res IFF brushes of all 50 US States, 10 Canadian Provinces and countries in Europe. Each map has a 3D extrusion effect with cast shadow.

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TC34AB: Optimizer will permanently speedup your hard-drive or floppy disks. LCD Calc is a nice full-screen calculator. BBaseII is a useful database program. FixDisk will correct many problems with disks. BizCalc is a loan analyser. Interferon is a Tetris-type game. Nebula is a 3D space game. PicBase will allow you to track all the IFF images you have. Hate is a great Zaxxon clone.

TC33AB: Measures 1.0 is an incredibly useful utility that will convert any type of mea-surement to another. DiskLabeler is a database designed for storing and printing 3." disk labels. Jewels is a Tetris-esque game of action and strategy. Switch is a fun board-game. Gfxclipper will allow you to grab any screen and save it as an IFF pic-ture. Softball Manager is a database for storing stats for softball—any number of leagues may be tracked. WBExec allows you to execute CLI commands from within the Workbench. Several Clipart images are also included.

TC32AB: Computer Coloring Book is a delightful program for children of all ages—comes with 15 pages of pictures to color again and again. Listmaker lets you make, edit, combine and print lists of words—great for those spelling tests! Moresmooth! scrolls text files smoothly on the screen and allows easy printing. Pocket Billiards lets you choose from several of the most popular pool games with realistic action. Texture allows you to create, manipulate and save (in standard IFF format) realistic fractal tex-tured surfaces. Plague is a monster maze game. Also includes Screen Fader, Snowbench, and FlipBench.

TC31AB: Calendar Publisher is a professional-caliber calendar maker that is customiz-able. CrossCircuit is a 1 or 2 player action/logic game that calls for fast reflexes and thinking. APR is a much-needed printer utility. Pizza Delivery Man is a maze game where you deliver pies in your neighborhood. Multiplayer is a single program that will let you see IFF pictures/brushes or playback IFF sound samples. Also includes RAMgauge, 3-D vector objects and Hi-Res IFF brushes of maps and flags of European countries.

TC25AB: ScreenToIFF captures your screen to an IFF file. PopColors lets you change the colors of your Workbench screen. Warrior is a fun shoot'em-up/adventure game for one or two players. Kaleidoscope is a line drawing program. Blockbusters is a game where you get rid of blocks by pushing matching blocks into them. Amidemo will show-off your Amigas ability to do solid-polygon animations. Microscope lets you examine memory at any location. Also includes Hi-Res IFF brushes of all 50 states and 10 Canadian provinces, nine digitized sounds and two small disk utilities and print-er utility.

TC24AB: TableMaker is a tool for effortlessly building numerical tables. Kooties is a fun game where you have to assemble a bug before the computer beats you to it. HyperText lets you put links in a text file to other text, graphics, sound, animation, ARexx and other applications. The Little Black Book is a wonderfully useful telephone and address book. Color Logic is a MasterMind-type game. Also includes several disk and memory utilities—and some animal sound effects to top it off.

TC23AB: WhereIs lets you quickly and painlessly find a misplaced file on your drive. Select creates a window from which you can run your favorite programs. MatheMagic lets you find the day of the week for any date in the century, also lets you enter statisti-cal data to be analyzed, graphs data, and solves linear algebraic equations. Pointer List Maker lets you create your own pointers or import pointers from other programs and save them in a disk file. Dyno-Wars requires more strategy and thought than your regular checker board game. Also includes Mr. Monster and Trilion games, 3-D objects, six sound effects and an animation of a pretzel.

TC22AB: Amiga Checkbook is a fast checkbook manager with check printing ability, budget analysis, and a report writer. AmiCrypt is a file encryption/decryption tool to password-protect any file...a must for security. WaveSyn lets you design musical instruments and waveforms for use in other programs. It also lets you play your key-board like a piano. Cinco is a game where you try to get five X's in a row before your opponent does. AlterCLI lets you change attributes of your CLI window (width, title, depth, height, location, colors) with a single command—very useful for scripts. Also includes an animation by renowned Amiga-artist Lou Markoya, as well as 3-D objects.

TC21AB: Circe is a "risk-style" game where you battle the computer to take over the planet. Batchman allows you to execute CLI programs, batch files and ARexx scripts by simply clicking on a gadget. Colors prints color test sheets and assigns RGB val-ues to printer and screen output....absolutely invaluable to achieve the best color print-ing results. Easyfile is a powerful database for home or a small business. Sprite Editor lets you easily create animated sprites. Plus 3-D fruit objects and five sampled sounds.

TC16AB: Cyberscape generates complex 3-D vector objects of terrain and saves your objects in Sculpt or Turbo-Silver format. Mathplotter graphs mathematical equations in both 2-D and 3-D. Double Print prints your text files on both sides of the paper. Metamorph, a graphic adventure game, Tinyball—the worlds smallest baseball arcade game and 6 digitized sound effects.

TC15AB: Labelmaker is a very easy to use label program. SurroundCycles, a high-speed arcade game. Dot2Dot, an adaptation of the classical connect-the-dot game. A tutorial on animation techniques by Amiga-artist extrordinaire Brad Schenck complete with one of his animations. Also includes a collection of clip-art and more animal sounds.

TC14AB: AmigoFile is a database and address book. Graph 3-D lets you visualize complex data in a 3-D manner and save the results. Spectrogram analyzes and dis-plays digitized sounds. Pteronadonaball—an animation by Lou Markoya. Also includes 3-D Tic Tac Toe, 3-D objects, food clip-art, and sampled sounds.

TC13AB: StrucGen lets you create gadget, text, bitmap, and window structures and writes the C source code for you. LifeCycles plots your biorhythms. Create spectacu-lar images with Mandelbrots. Look, a CLI utility that helps you find files on your disk quickly and easily. Plus 3-D objects, holiday clip-art, an Amiga Flight animation, drive head cleaning utility, and technical discussion on how AmigaDOS stores information on disk.

TC11: DiskSalvage will fix corrupted disks and recover deleted files. IconMeister is an advanced Icon editor. AlienDuel is a fast, shoot'em-up game. Crystal Caverns is a colorful, graphic adventure game like the arcade game. Also includes an animation, sound samples, 3D dinner table objects, and Hi-Res monster clip-art.

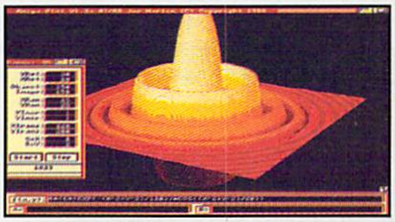
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RK3: 3D Objects an amazing collection of some of the best 3D objects we've ever seen. Also includes texture maps to wrap around some of the objects...1.5MB of data in all! $14.95

RK4: Home Manager This program will help you keep track of your life! Complete address book, appointment scheduler, notepad, auto-dialer (requires modem), area-code utility and complete inventory of all your possessions and credit cards. Extremely useful. Requires 1 Meg. $14.95



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MORE SHORT TAKES

TRACON II

That odd blip on the radar scope—the one coming out of the Bermuda Triangle—is Wesson International's long-delayed air traffic controller game ($34.95). Admittedly, keeping planes from running into each other is more an acquired taste than, say, flying them yourself, but the game (set over any of nine metro areas) feels scarily accurate at times, and I can easily imagine this stylish balancing act becoming a mild addiction. (I do wish they'd used digitized voices throughout, rather than the witless toy voice of the Say utility.) May your planes always stay on the glidepath.

CELTIC LEGENDS

Larry Bird does not have a featured role. Different Celts, y'see. This UBI Soft release is a rare breed—the swords-and-sorcery wargame—and it's right up there with SSG's Warlords. CL plays swiftly and elegantly and a decidedly French flavor is preserved throughout. And there's also something intangible going on here that sticks with me, makes me smile even when I'm not playing, and keeps drawing me back. I guess that's called atmosphere. Celtic Legends ($49.95) has tons of it. Nope, no Larry Bird, but still a three-pointer from downtown.

MIG-29 FULCRUM

Sorry about the age of this one, folks; it sort of slipped through the cracks. MiG-29 Fulcrum ($49.95) is a plain, yet serviceable, flight sim from England's Domark label (based around the fabled Soviet fighter) whose very ordinariness comes as something of a relief. It's also a pleasant change to fly for the other side (even though they're not the other side any more). But while MiG-29 is a bit old for review, it feels even older—as though it came out, say, around 1987. Try before you fly, comrade.

THE BLUES BROTHERS

The Blues Brothers ($49.95) is a little gem. Titus's name has never been associated with superior Amiga games over here, but that's likely to change on the strength of such offerings as this vast platform game—based around the antics of Jake and Elwood Blues from the movie—and the forthcoming Crazy Car 3 and Titus the Fox. Here, the little Ray-Banned characters are kind of adorable, the graphics superheated, and the difficulty is pitched just right—pleasantly tough. The levels are lovably extensive and, in their goofy way, realistic. They're on a mission from God. How could you stand in their way?

NO GREATER GLORY

The best Amiga wargame to come out of SSI in ages. For $69.95, it's an excellent conversion of Ed Bever's ultra-accessible strategic-level game of the American Civil War. Bever (co-author of some of MicroProse's early wargames) pulled off a neat trick—giving you control over all sorts of elements without ever burying you in detail. And now with Amiga menus, yet.

Alas, there does seem something a bit half-hearted about it—where's the Amiga version of Battle Hymn of the Republic?—and only the graphics can be installed to hard disk. But I can live with that. It's that good.

THE NEXT ROUND

HOME IMPROVEMENT— Long to be the architect of a community, not just a castle? If so, try your hand at Castles II: Siege & Conquest (Interplay Productions, $59.95). In it, you build and defend your castle, of course, plus you have the option to attack and destroy other players' castles. You and your computer opponents must shape administrative, diplomatic, and military strategies while exploring neighboring territories, defeating native militias, subjugating the land with castles, feeding and appeasing the people, and nurturing diplomatic alliances. If you accomplish all this too quickly, you can simply step up to the next difficulty level. (RS# 101.)

ARMCHAIR COACH— Pit your football team against a friend's over a modem or the computer in Tom Landry Strategy Football (Merit Software). Customize your own formations or choose from more than 2500 offensive play options and a multitude of defensive sets, then watch the results. (Instant replay is still allowed in this league.) As in the NFL, you'll have to contend with weather, scouting information, and substitutions. Need help from the pros? Get advice with the Ask Landry command or let the computer call the plays for you. If you'd like to experiment before game time, use the scenario editor to create and save game situations. Super Bowl, here you come! (RS# 102.)

VIRTUAL REALITY FLIGHT— Don your 3-D glasses and take aim at a friend or the computer in VR Slingshot (Ixion Inc., $129). The action in this comin'-at-ya 3-D flight simulator takes place in a closed space that contains a spherical gravity generator. To pick up attack speed or escape your attacker, slingshot around the generator. The goal is to deplete your opponents energy reserves before you lose yours. Besides good reflexes, you'll need an analog joystick (an adaptor is included) and, for 3-D mode, 60Hz 3-D glasses (such as Haitex's X-Specs). Should the glasses not be available, a 2-D mode is. (RS# 103.)

KINGS AND CADDIES— Compute Books wants you to improve your game. The Official Book of King's Quest, Third Edition ($16.95, ISBN 0-87455-274-5) will help you raise your King's Quest (Sierra On-Line) scores, while Pro LINKS: The Official Guide to LINKS and Microsoft Golf ($16.95, ISBN 0-87455-269-9) will lower your golf average. Written by Donald Trivette, The Official Book of King's Quest provides maps for all King's Quest adventures, hints and strategies, an interview with creator Roberta Williams, and more. Pro LINKS by Peter Scisco discusses courses hole by hole and covers all versions of LINKS from Access Software (but leans heavily to the PC side). A list of general strategies, charts of putting, chipping, and driving for all clubs, and a glossary of golf terms are also included to keep you out of the rough. (RS# 104.)

WATCH IT GROW— Dark Seed from Cyberdreams may give you nightmares. In this graphic adventure you play Mike Dawson, who simply wants to move into his new house and write a book. While awaiting the movers, he falls asleep and awakes, not to his furniture, but to the Dark World. Its ancient civilization is dying and its evil biomechanical inhabitants have chosen Mike to help procreate the race. You'd better find a way to escape! The game comes with a hint book (in English or German) and is lavishly illustrated by H.R. Giger's surrealist drawings. (RS# 105.)

JOIN THE FUN— Do you have any new games on the drawing board? Don't keep them to yourself! Tell us about them. Send all of the particulars to The Next Round, *AmigaWorld*, 80 Elm St., Peterborough, NH 03458. ■

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HELP KEY

Don't believe it when they say "You can't get there from here." Tim will show you Amiga to PC and back again.

By Tim Walsh

PC Format Follies

Q. *I've read that the A4000 can read and write MS-DOS formatted disks. As a small business owner with both a DOS laptop and an A500, I've had no luck trying to get my Amiga to handle MS-DOS files. I have several MS-DOS utilities for my Amiga, but no disk that I format on my laptop can be read on the Amiga.*

Randy Myers
Boulder, CO

A. The A4000 comes with a program from Consultron called CrossDOS ($39.95) that allows the computer's disk drive to read and write to PC-formatted disks. Because the A4000 has a high-density (1.7 MB) floppy-disk drive as standard equipment, it also handles high-density PC disks created on most newer laptops.

You didn't say which type and model of laptop you're using, but it's probably safe to assume it's a newer model that uses a high-density drive. With the exception of a limited number of A3000s, virtually all Amigas that predate the A4000 are fitted with low density $3^1/_2$-inch drives, which makes them incapable of handling high-density PC-formatted disks.

The solution's simple: Format the PC disks in *low-density* mode on your laptop, or, better still, use one of your PC-compatible utilities to give them a low-density PC format on your Amiga. That will ensure their compatibility with the Amiga drive.

Almost all the major telecommunication networks and Amiga PD disk collections offer an MS-DOS utility called MultiDOS. A freely distributable program written by Kjell Didriksen, it allows all Amiga floppy drives (and high-density drives) to double as MS-DOS drives with no ill effects.

To install it, you simply copy its files to their appropriate Workbench libraries (L, Devs, System) and follow the instructions. (Note: Those unaccustomed to the Shell will find the program requires more than a passing familiarity with CLI commands.)

To minimize the typing MultiDOS requires, I've listed three scripts that work on all Amigas equipped with AmigaDOS 1.3 or higher. (The CD command on the first line is optional with AmigaDOS 2.04 or higher.)

First, type in the following two lines and save them with the filename "PCFMT" in your C directory:

```
CD SYS:SYSTEM
PC FORMAT DRIVE MD0: name MS-DOS
```

Next, type in this script and save it to the C directory as "PC":

```
CD SYS:SYSTEM
PCMountAll
```

Finally, save this script in the C directory as "KILL":

```
CD SYS:SYSTEM
PCKillAll
```

Finally, open a Shell window, type CD SYS:C and set the Protect bit on each of the above files to make them executable from any Shell. The syntax for doing that is as follows:

```
PROTECT filename +S
```

Once the above procedures are complete, to activate MultiDOS, just open a Shell window and type PC. Formatting an MS-DOS disk in drive df0: is as easy as entering PCFMT. While you could keep MultiDOS running in the background, it does add additional devices to all file requesters and occasionally interferes with obscure tasks and disk operations. The "Kill" script deactivates it from any Shell window.

There's no need to get a PC-compatible emulation board for your Amiga unless you plan to run MS-DOS *programs* on it, and these cards won't allow your A500 to read high-density PC disks. I've reviewed PC-compatible boards for the A500 that come equipped with CrossDOS to transfer files between Amiga and PC formats.

dBase on Amiga?

Q. *I've read that the files created with dBase III can be used on Amiga databases. After asking several local Amiga experts, they all had similar techniques for copying the files from my 386 PC-compatible at work, but none knew how to manipulate them on the Amiga. Can I upload these files to my A3000 and work on them at home?*

Len Carter
Albany, NY

A. You need Superbase Professional 4 (Precision Software, $495) for your A3000. Superbase and dBase, though widely different in design, perform much the same. For simplicity's sake, let's assume you have a name and address list on your PC that needs to be on the Amiga. You don't need to use modems to upload the file to your Amiga—a disk utility such as MultiDOS (see above) is faster and easier.

Since Superbase can import dBase files, the first step is to create an empty copy of a data file with a structure that matches the dBase file field by field. If the dBase file is large (100K+), copy it to your RAMdisk to make the process as fast as possible. Next, select the Import function from within Superbase. Select the file to be imported and the computer does the rest.

If the dBase file was imported from the RAMdisk, your new Superbase file will be in RAM as a series of three or more files, too. Immediately copy them to another device for safe-keeping. A word of caution: dBase II and III files imported into Superbase cannot be edited as standard data files. You can use the Modify File option under the Project menu to add fields to dBase files imported into Superbase format, then import more dBase files or other data files into the modified file. ■

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UNBEATABLE VALUE!

DD79abcd: Amiga "C" Tutorial - This is the most comprehensive C language--*Amiga oriented*--set of tutorials available. Includes full working examples, source code and an incredible set of lessons. Included are full discussions and examples for Amiga programming. 4 disk set, counts as 3.

WB118: Amiga Beginner - You asked for it! This disk contains a complete tutorial for the beginner on using the Amiga. Starts you off at the power-switch and takes you through to the CLI/Shell and all points in between. *Bonus!* Also included are 16-color icons to replace *every* icon in your 2.0+ Workbench.

NEW DISKS

FD84: Games! Deluxe PacMan is better than the origional--20+ mazes, special "power-ups" with *oustanding* graphics. ThinkAmania is the classic game of concentration--with *beautifully* drawn HiRes images.

FD83: Arcade Series: Contains Croaker and Squamble, two great clones of the arcade games "Frogger" and "Scramble."

FD82: Intrepid - In the Arctic ice, you control a tank on a mission to rescue hostages in this superbly crafted Amiga origional.

FD81: SuperGames - Some of *the* best games--Donkey Kong is better than the origional *with an extra level*! Frantic Freddie and TrailBlazer are both fast-pased arcade games. Mad Bomber is the classic game of "Kaboom" redone with an Amiga flare. All of these games are excellent!

FD77: Arcade Series - Galaga'92 is a clone of the arcade game of the same name with several gameplay enhancements--with smooooth, sharp graphics, it's better than the origional! Pharaohs Curse is a clone of the origional C64 classic. Diplomacy is a beautifully computerized version of the Avalon Hill board game--conquer or be conquered!

WB122: System Optimizer - KCommodity ehances your system, gives memory meters, mouse/keyboard enhancements, online timers plus *many* others...too numerous to list! REorg will optimize hard and floppy-disks for a big speed increase. HDMem will allow you to use up to 2 megs of hard-drive space for virtual memory! (Req. 68020+ w/MMU) All programs require 2.0+.

WB121: ProPage3 Enhancer - This disk contains over 40 "Genies" for use with ProPage 3.0, including useful ones like Make Pie Chart and Resize Text to fit Box to name a few. Also includes structured & bitmap clipart for unique borders...a *must have* for all PPage 3 users.

WB120: Grinder - a complete graphics conversion package that supports GIF's, JPeg, Atari ST (Neochrome & Degas), PCX, Targa, TIFF, HAM-E and IFF format pictures.

WB119ABCDE: Font Set This collection contains over 100 typefaces for use with Professional Page 3.0 or PageStream 2.1+. These fonts will output to any laser printer or dot-matrix printer with no jaggies, thanks to outline font technology. Very professional looking typefaces. *5 disk set, counts as 4.*

DD88: GnuPlot - This is a command-driven interactive function plotter. Creates stunning plots/graphs of mathematical functions. Requires hard-drive and unpacks to over 1.6MB of code/data...most impressive!

FUN DISKS

FD5: Tactical Games - BullRun - a Civil war battle game, Metro you play the role of a city planner. Build wisely and your system will be a success, but poor planning will lead to disaster and financial ruin. Very very habit forming.

FD6: GAMES! - This disk is chock full of games including; Checkers, Clue, Gold - A new slide the pieces puzzle, Jeopard - An enhanced version of Risk, RushHour - Surprisingly addicting, and SpaceWar - Best described as a cross between Combat-Tanks and asteroids.

FD7: Pacman - This disk contains several pacman type games including; PacMan87, MazMan and Zonix.

FD9: Moria -. This has great graphic controls, multiple spells, similar to Larn and Hack. Play time several weeks!

FD10: HackLite - A dungeon adventure game. Considered a must-have classic. This is the second release of this game on the Amiga. Great graphic interface. Play time several weeks!

FD11: Las Vegas and Card Games - Las Vegas Craps - The best Las Vegas Craps simulation every written for any computer. Contains extensive HELP features, Also Thirty-One,VideoPoker and more.

FD12A,FD12B: Star Trek, The Game - This is by far the best Star Trek game ever written for any computer. It features mouse control, good graphics, digitized sound effects and great gameplay. Counts as 2 disks. Req. 1Mb and two drives (or hd).

FD13: Board Games - contains multiplayer Monopoly, Dominoes, Paranoids, and others.

FD14: Dungeon Master Hints and Arcade Games - DM maps, spells, item location, and hints and more, also on this disk, Hball - an arkanoid/breakout type game, Trix - a Qix type clone.

FD17: Educational Games - This disk includes several games for the younger members including geography, math, science, and word games, also includes Wheel of Fortune.

FD20: Tactical Games - MechForce(3.72); A game that simulates combat between two or more giant, robot-like machines. Simple words can't begin to give you the feel of piloting a 30 - 40 foot tall, fire breathing, earth shaking colossus that obeys your every whim.

FD26:Arcade Games - Marble_slide is a commercial quality game—similar to a Lucas game named PipeDreams, excellent playability and entertainment. Mutants—a small version of the same arcade game. SuperBreakout is a Pong/Arkanoids type game.

FD27: Arcade Games - This disk is loaded with some great games. Includes, Raceorama a great racing car game with ten different courses, MiniBlast a helicopter gunship type clone, Shark in the same class as froger, and SBreakout the original breakout with more.

FD29: Shoot'em up's - WWII - you're the pilot of a WWII plane flying through enemy territory, you've just been spotted, good luck on you mission, SpKiller - try and penetrate enemy lines with this game, and Retaliator - another great game.

FD31: Games! - Air Traffic Control - a good ATC simulation, Black Jack Lab - a full featured set of card games, ChessTel - play chess with your friend in distant and remote places with this game and a modem, labyrnth - a well done text adventure game (like an infocom game), and MouseTrap - a 3d maze game.

SPECIAL PRODUCT!

QT1: THE A64 PACKAGE - A very complete Commodore 64 emulator. Supports any CPU and is fully compatable with WB1.3 & 2.0. This version includes a special adaptor that will allow you to connect your 64's 1541 disk drive to your parallel port of your Amiga for total emulation. Two disk set, counts as two. Special price $49.95 - including hardware.

FD32: Flight Simulator - An instrument flight simulator for a DC10.

FD33: Arcade Games - Ffreddy a Mario Brothers type of game, Gerbils a target practice game, PipeLine a German interpretation of Pipe Dreams, Tron a light cycles version, and Wetroids a wonderful version of asteroids with a hilarious twist.

FD35: Omega (v 1.3) - A new outstanding dungeon and outdoors adventure game in a similar vein as hack, rouge, and moria. This version is considerably faster and better that all previous versions. Play time several weeks.

FD37A&B:Tactical Games - Empire (2.2w) This great game comes highly recommended. With a full-graphic front end.

FD38: Games - Cribbage Master - A great cribbage game and tutor, Spades - a well done card came, ChineseCheckers - A computer version of this classic, Puzz - a slide piece puzzle game and construction set.

FD39A&B: Star Trek, The New Generation - This is a, completely different version of Star Trek than that found on FD12. This one was created by the German author Tobias. Now with English instructions. Excellent!!! Counts as two disks. Requires 512k

FD44: Game - Mechfight is an out of this world role-playing adventure comparable to hack and moria. The setting, interplanetary colonies and space stations. In your quest to explore the world, take time out to liberate bad guys of their most valuable possessions, engage in a mortal combat or two against robots and alien life forms, pick up a new Amiga 9000. Most of all, don't forget to stay alive...

FD50: Submarine Game - Sealance, one and a half years in the making, this is an outstanding submarine tactical game. Commercial quality, highly recommended.

FD52: Classics Games - PetersQuest a well done Mario brothers type of game, Jymbc a two player missile command clone, and Vstank a tank commander game.

FD53: Great Arcade - On this disk is a wonderful implementation of the ever popular classic arcade game Defender. Also contain Air Race a WWII flying ace arcade game, and Psycoblast new creation idea game.

FD57: Arcade Games - Includes 2 truly commercial quality games. MegaBall, an Arkanoid-ish game, features 5 musical scores, multiple levels and addicting gameplay Gravity Attack is a psychadellic trip through several different worlds—each distinctly different.

FD59: Game Potpourri - Xenon III is an almost exact clone of the commercial game of the same name...a great shootemup. Crossword will take lists of words & automatically generate word-search puzzles for any Epson compatable printer.

FD60: Games - In Nebula, race over a 3d world to destroy enemy installations. Interferon; a great Dr. Mario clone. Enigma; is it a gameor a puzzle?

FD61: Games - Solitaire; great graphics, plays two versions. Klide; an interesting piece of eye candy. Extreme Violence; 2 player kill or bekilled game. YATC; A Tetris clone with Artifical Intelligence. Genesis; create realistic 3d fractal worlds.

FD62: PomPom Gunner. An extremely smooth and well done World War II gunner simulation. Requires 1 megabyte of memory.

FD64: Games - Wizzy's Quest - a "great" 50 level game with great graphics, Cubus - a 3-dimensional Tetris type game (rotate and move in 3 dimensions). Husker Du - Colors and pattern rather than shape in this Tetris-esque game; 5 screens and 3 levels of difficulty. Requires Fat Agnus (1 Meg of Chip)

FD67: Arcade - Includes Llamatron a well-done 'Robotron' clone. Hate is a "terrific" commercial grade Zaxxon clone with multiple levels/worlds and smooth diagonal scrolling...a 10!

FD68: Potpourri - Eternal Rome is a strategic simulation of the Roman Empire including military, diplomatic, political, economic and social factors. Lord of Hosts is a board strategy game for 2 players. In Moonshine, you've got to get the hootch across the state line—a great rolling, scrolling driving game!

FD69: MindGames - Had enough of shoot-em up games? Relax and let these 21 games exercise your mind instead of your wrist.

FD70: SpaceGames - Contains AmiGoids, >finally!< an Asteroids game that takes advantage of the Amiga—totally configurable with great sound and grpahics. In Cosmostruction the object of the game is for each Cosmostruction team to acquire the most points while construction energy ducts between the space station and planetoids.

FD71A&B: Star Trek: TNG Trivia Challenge - So you think you know The Next Generation, huh? Complete with fantastic sampled sounds and digitized images, this game even looks and sounds like a genuine Star Trek terminal! VERY thorough and complete! Counts as 2 disks.

FD72: Sword of the Warlock - This is a demo version of a great public domain graphic dungeon adventure game. The adventure spans three diskettes and allows two players to go adventuring. The game has a 'Bards Tale' feel to it. Three disk set, counts as 2. Requires 1 meg of RAM and 2 floppy drives--HD installable.

FD73: Arcade Series - Intruder Alert! is a MULTI-level "Berserk" clone. Features smooth gameplay, great graphics & digitized sound f/x.

FD74: Arcade Series - RingWar is an "Outer Limits" clone with vectorized graphics. MotherLode is a "Lode Runner" clone with 50 levels! In BlitzTanks, they're coming at you from all directions!! Call in air strikes and use your heavy artillery to survive!

FD75: Arcade Series - Descender is a clone of the classic arcade game "Tempest"; complete with vectorized graphics. Tanx is the classic battle of trajectories and inertia between two tanks—incredibly well done! Search is a maze game unlike any other—included is a level editor too. (Tanx requires 1 meg chip memory=Fat Agnus)

FD76: Catacomb - is a full graphic dungeon adventure game with beautiful graphics and a very slick icon/mouse driven interface.

WORKBENCH DISKS

WB4:Telecommumnication - This disk contains several excellent pd communication programs designed to get you on line quickly and easily, Access (1.42) - A very nice ANSI term program. Comm (1.34) - Latest version of one of the best public domain communications programs ever made on the Amiga, Handshake (2.12a) Handshake is a Full featured VT52/100/102/220

WB5: Fonts #1- Several fonts (35) for the Amiga, also included are five PageStream fonts,and ShowFont - a font display program.

WB6: Fonts #2 - ShowFont(4.0) This program allows you to quickly and painlessly view all 256 characters in a typical font. Large AmigaDos system fonts (many up to 56pts).

WB7: Clip Art - This disk is loaded with black and white clip art. Art includes, trees, watches, tools, US and State maps, and more.

WB9: Icons - Truly a multitude of various types and kinds. Also includes IconMiester, IconLab, and others great utilities to help generate icons.

WB10: Virus Killers - The latest and best VirusX(4.0), Kv(2.1), and ZeroVirus III.

WB11: Business - Clerk(4.0), finally a full featured business accounting PD program for the small to medium company. Includes receivables, payables, end of month and uch more.

WB12: Disk Utilities - This great disk is loaded with wonderful utilities for everything including making disk labels, disk cataloging, disk optimizing, disk and file recovery archive and organizing, and all sorts of file manipulation. A must have!

WB13: Printer Drivers and Generator - over 70 different drivers (including HP LaserJet 3&4!), also includes a printer-driver generator.

WB15: Business - This disk contains a spreadsheet, a database, a project/time management program and financial analysis (stocks).

WB16: Business - This disk contains an inventory manager, a loan analysis program, a great calendar/scheduler, a rolodex program, and penny-wise a good "Cash Book" accounting for home or office.

WB18: Word/Text Processors - This disk contains the best editors. Includes,TextPlus (v2.2e) a full featured word processor, Dme(v1.35) a great programmers editor with strong macro features,TexED(v2.8) an enhanced Emacs type editor, and a spell checker.

WB22: Fonts #3 - Several more great fonts. These, like the other font disks work great with Dpaint and WYSIWYG word processors.

WB23: Graphics and Plotting - Plot (20b) a three dimensional mathematical function plotter. Can plot any user defined function, BezSurf2 - produce awesome pictures of objects one could turn on a lathe. Can also map iff image files onto any surface that it can draw. Now compatible with most 3D packages, and VScreen - makes a virtual screen anywhere, great for DTP!

WB25:Educational - On this disk are two programs that can generate maps of differing types, World Data Base uses the CIA's data base to generate detailed maps of any entered user global coordinates. Also Paradox a great demonstration of Albert Einstein General Theory of Relativity.

WB26: Disk Utilities #2 - MrBackup, KwickBackup - two well done utilities to do harddisk and floppy disk backups, FileMast - a binary file editor, Labelprinter - Disk label printer with very powerful features.

WB27: Nagel - 26 Patrick Nagel pictures of beautiful women.

WB29: Graphics and Sound - This disk has several different Mandelbrot type programs for generating stunning graphics. Includes, MandelMountains - a realistic terrain generator, Fracgen - generated recursive fractals from user input, Mandelbrot and Tmandel - two fast mandelbrot generators, also Mostra - the best IFF display program to date, will display ALL IFF's including Dynamic HAM, and Sound - a great IFF sound player, will play anything.

WB33:Circuit Board Design - several terrific routines for the electronic enthusiast, Including PCBtool - a circuit board design tool, LogicLab - circuit logic tester, and Mcad (1.26) a well done new release of this PD CAD program, now comes with predrawn common circuit components for insertion into schematics.

WB34: Utilities - Several well done utilities, some will require moderate knowledge of a CLI or Shell for setup, Chatter Box - this one will play any user defined sound after any event (ie. disk insert, mouse click, disk removal...), , Artm - The Amiga real time monitor, gives you full control of the Amiga OS, very powerful program, Helper - help program to make learning the CLI easier, and more!

WB35: 3D Graphics - This disk contains several neat programs to use with your 3d modeling/raytracing programs 3dFonts - Full vector font set for use with 3d programs, FontMaker - make 3d fonts from any system font, Make3DShape - create 3d shapes from any image, DumptoIFF - cre-

ate 3d animations preserves pallet, and World3d - a demo program of a front end for use with DKBRender.
WB36: Graphics - On this disk are several programs to create stunning graphical images including, MPath - creates swirling galaxy images, Roses - produce an unlimited number of variations of images that a symmetrically similar to a rose, SimGen - display those spectacular images as part of your workbenck screen, and RayShade - a very good raytracing program, create your own beautiful 3d graphic models with this one!
WB37: Educational - Educational games and puzzles that cover math, geography, spelling, and books. Ages 6 - 15
WB38: Plotting and Graphics - Plotxy is a powerful full featured plotting package. Used by many colleges and universities. Highly recommended. Plans - a incredibly well done Computer Aided Drafting program, very full featured. Tesselator - a program that helps generates fantastic looking, recursive M.C. Ecsher type pictures.
WB40: Music - "CD on a disk", 90 minutes of modern music on this well presented collection. Requires 2 drives or HD.
WB41: Music - MED an incredibly well done, full featured music editor. Create your own stunning music directly on your the Amiga. Similar to SoundTracker but better. Very powerful easy to use program. Version 3.20, which is compatable with WB2+.
WB43: Business - This disk contains AnalytiCalc - probably the most powerful spreadsheet program on the Amiga. A full featured spreadsheet with many features expected in a commercial package. Req. 1.2 MB
WB46: Clip Art - HighRes clip art with the following motifs - embellishments (borders, dodads ,...), people, and transportation.
WB47: Clip Art - HighRes clip art with the following motifs - hair, drafting, summer, animals and macfood.

Memorex blank disks-3[1/2]" DSDD

10 for	$8.00	(.80 cents ea)
25 for	$19.25	(.77 cents ea)
50 for	$36.00	(.72 cents ea)
100 for	$67.00	(.67 cents ea)

No shipping charge on USA blank disk orders, Canada and Mexico add $.15 each, other foreign add $.50 each.

WB48: Clip Art - HighRes clip art with the following motifs - Holidays, music, medical, and misc.
WB49ABC:Animation Sampler - On this three disk sampler set (counts as two disks) are some of the best animations that have been created over the last three years. Several examples of "Movie" type animations some with spectacular raytraced reality (coolroby, watch, spigot and egg). Also several european style or "Demo" animation with incredible graphics and outstanding electronic music (akrilight, copersine, doc, dps2010, impact, and logodemo). These truly show off the Amiga!
WB50: Animation - Seven of the best european style animations or "Demos", including - scientific 451, subway (a U.S. entrant, also our favorite), sunride, thrstdemo, tnight, waves, and woow.
WB53: Graphics - Raytracing programs generate absolutely stunning realistic looking planes, rockets, buildings..., and surreal images often consisting of highly polished spheres and objects. C-Light is the most powerful EASY-TO-USE of it's kind we have seen to date. This is easily better, and more full featured, than similar commercial programs costing in the hundreds of dollars. Also, sMovie - a full featured video text titler similar to ProVideo, Broadcast Titler. Great video scrolling, wipes, special effects, and more...
WB54: Printing - This disk contains several routines to help with the chore of printing. Includes Gothic - Finally a Banner printer for the PD! PrintStudio -a well implemented all-purpose printer-utility with a very comfortable graphic interface and many advanced features, Lila - with ease, print ASCII files to a PostScript printer, and many more.
WB55: Application - XCopyIII - a full featured disk copier, make backups of copy protected disks. RoadRoute - find the quickest route from one city to another, highway description included. Diary - a diary program like "Dougy Howard M.D", Cal - a calendar program, Magman - a database tailored to maintain records on articles and publications.
WB57: Animation - This disk has several "Demo" style animations, Including, Blitter, Lolly, Sun5, vertigo, vortex, and xenmorph.
WB62: Midi Utilities - Several useful midi utilities including, programs to transfer to and from several music programs to midi, a midi sysex handler, a midi recorder with timebase, display midi info, file sequence player, and a few scores.
WB63: Disk Utilities #3 - Several highly recommended programs to aid in removing duplicate files from your hard drive, performing file backups, Binary editing, fast formatting, file recovery, disk track recovery, and forced DISK VALIDATION of corrupt disks.
WB66: Icons #2- Lot's of neat icons. Also, several wonderful programs that to let you create your own icons, modify and manipulate icons and info structures.
WB68:Music Utilities - several good utilities for the Amiga music enthusiast. Includes, Noisetracker - a great music creation program, Sonix2MOD - converts sonix to .mod files which then can be used by noisetracker, soundtraker, and MED, SpeakerSim - a speaker design tool demo, Wondersound is an additive harmonic instrument design tool with a separate envelope design window and 16 relative harmonic strength and phase angle controls.
WB69: Music - This disk has over 90 minutes of classical and modern electronic music for you Amiga.
WB70: Desk Top Pub - Atcp - transfer Macintosh screen fonts, Mac or IBM format .AFM metric files, to Amiga screen fonts and PPage .metric files. With this program, open the door to the libraries of Adobe and PostScript fonts! Calendar - month templates in PageStream form. Post - a full featured postscript file display and print utility.
WB75: Music - over 100 instruments files (.inst) and sample sound files (.ss) for your music programs.
WB76: Applications - This disk contains Stichery - a often requested knitting design program, Lotto - a rather complete lottery tracking and prediction utility, SSS - this screen capture program can grab almost any screen including games, Today - a personal calender, Tarot - fortune teller, and Grammar - grammar checker.
WB79: Home & Business Accounting - Includes Ckbacct - the most complete checkbook accounting program going, LCDCalc - this well done calculator has a very large display and operates from the keyboard or mouse, Mileage master - monitor your automobile mileage with this mileage log, Grammar - a grammar checker, and Worldtime - find out what time it is in up to 50 global cities.
WB81: Great Applications - DataEasy a very easy to use, database program. Don't let the ease of use fool you, this is a very full featured database program including full printer control for address labels and mail merge applications. Also includes, TypeTut a good typing tutor, RLC a full featured label printer, Banner, a multi-font banner maker, and Budget a home accounting in a program. Highly recommended.
WB82: Animations - Four full length, well done "movie" style animations. Including, Coyote, JugglerII, GhostPool, & Mechanix. 2 disks, counts as 1.
WB83: Computer Art - this disk has some of the best Amiga generated computer art that we have collected in the past 5 years.
WB88ABC: The Complete Bible - A three disk set, with the entire text of the New Testament and Old Testament-King James version. A great utility. Three disk set, counts as three.
WB90: Rippers, Strippers and Beats - For the Amiga music enthusiast, this disk contains many programs designed strip music from your favorite games and programs. Also contains Drums, a very nice drum machine. This disk requires some knowledge of the CLI.
WB93: Workbench Extras #2 This disk contains the utilities that Commodore should have shipped with the Amiga; VirusX4.0, Snap, FixDisk (recover corrupt/deleted files), Disk Optimizer (floppy & hard), MachIII (screen blanker, hotkey, mouse accel., macro, clock utility), GOMF (a gurubuster)and PrintStudio.
WB95: Checkbook Accountant 2.1 - This is definitely commercial grade; we've seen many checkbook programs and this is absolutely the best. Full budgeting, transaction recording and report generation.
WB96: Dupers - Contains XcopyIII & Nib which will backup copy-protected programs. FreeCopy removes copy protection from several programs, and SuperDuper will crank-out fast AmigaDOS copies.
WB98: Business - Includes BBaseII a nice, powerful database; BizCalc—a personal or mortgage loan calculator with amortization capabilities, Loop—a flowchart maker, Formmaker - design professional forms on your Epson LQ-2500 compatible printer.
WB99: Lifestyles - Includes AGene—family tree program that tracks up to 600 people/marriages/etc. Landscape is a CAD program to create gardens/landscapes. Loom simulates an 8 harness loom; experiment with pattern design in an instant feedback environment.
WB101: Chemesthetics - is a program that displays molecules as a calotte model. This kind of display contains a certain esthetic attitude, even poisonous molecules like nicotine and dioxine look quite nice.
WB102: Telecommunications - Contains the programs NComm 2.0 and VT100-29B. Zmodem protocols, XPR protocol support, full VT100 emulation. NComm's script language is so powerful it comes with a script file that creates a full-featured BBS system.
WB103: Music - Contains 12 "great" Soundtracker/MED music MODules...complete with programmable/shuffle player...8 bit audio never sounded so hot! Two disk set counts as two.
WB106: Home Manager - This is a great all-in-one address book with an autodialer/notepad/to-do list/appointment scheduler/home inventory database and phone number dialer.
WB108: OctaMED - This breakthrough program doubles your Amiga's sound capabilities from 4 channels to an ear-popping 8 channels! All the renound editing capabilities of MED plus 4 more channels! If you thought your Amiga sounded good before...you aint heard nuthin' yet!
WB109: VerseWise - Display, search and output The New Testament to text files or your printer.
WB112: Productivity/Business - Stock Analysis allows automated downloading of stock data with full analysis capabilities (requires modem). SubStore will allow you to log magazines and articles with full search/scan/print capabilities.
WB113: Sid II - Why pay 40 bucks for a directory utility, when this one will do it all plus much more! A truly professional-caliber program. Sid 1 was our best, now *completely* rewritten, Sid 2 will astound you.
WB114: Fonts #4 - Contains 36 bitmap system fonts.
WB115: Term - If you have AmigaDOS 2.04+ and a modem, then this is *THE* program for you. Term *totally* conforms to the User Interface Style Guide for 2.04, has an ARexx port, and supports all popular file-transfer protocols through XPR libraries. We wish all programs were this good.
WB116: Databases - This is what you've been waiting for! Contains 5 uniquely specialized dtabase programs for tracking: Videotapes, CD's, Magazine Articles, Comic Books and Trading Cards!
WB117: Religion - Contains Scripture_Mem (aids in memorizing verses and passages) and in Pauls Journey, you are Paul of Tarsus exploring the Mediterranean and preaching just as Paul did. Req. 1 MB RAM.

DEV DISKS

DD45: AREXX Programs - This disk contains several useful arexx programs and examples, PopCLI4 - The latest of a must have utility.
DD47: Pascal - This disk contains everything needed to program in Pascal. Includes, A68k (1.2) 68000 assembler, Blink linking software and PCQ (1.0) a modest Pascal sub-set compiler.
DD49: C Compiler - contains zc(1.01) fully K&R, zcc(1.0) front end, A68k(1.2) assembler, Blink linker.
DD50: ARexx #2 - a must have set of tutorials on ARexx and several useful examples and utilities for ARexx development.
DD51: Circuit Analysis - Aspice (2.3) A full featured program for electric circuit analysis.
DD52: Scientific - Includes Elements - an incredibly well done periodic table program with source, Scientific plotting - over 600k of Lattice C source routines that can be included in your own programs.
DD54: Compression - This disk is loaded with all of the best file compression programs and aids for the Amiga. Many of the programs can be used by the new user. Includes Arc, Lharc, Lhwarp, Pkax, PowerPacker a must have by all, Zip, Warp, and Zoo. Also IFFcrunch an excellent compression for IFF files.
DD55: ARP - On this disk you will find the complete ArpRel3.0 release including the full user docs, the full Developers guide. ARP is the official AmigaDOS Resource Project (ARP) release 1.3. ARP makes many improvements to AmigaDOS and makes your CLI more powerful.
DD57: Advanced Utilities - Msh - like Cross-dos, copies files to and from MS-DOS, Pal-NTSC - convert any pal program to NTSC and vice versa, Also several boosts for your startup-sequence, plus 25 more programs.
DD62: Basic and Xscheme - Cursor - a full featured Amiga Basic compiler, sbasic and ftext - several wonderful routines to help in basic programers, and Xscheme - an interpreted object oriented language.
DD66: Programming ToolBox - Many programs to help in your development efforts (most for C some for basic) Includes programs to generate requesters, an incredible spritemaker toolbox, to greatly aid compiling, convert DPaint brushes to C structures, a great library manager, and many more wonderful time savers!
DD69:Advanced Utilities - SerNet and ParNet - Connect two Amiga's and share resources, MemMonitor - Similar to WFrag but greatly improved, Selector - put menus on your workbench screen, and more.
DD71A&B:C Compiler - This disk contains DICE, Matthew Dillon's full featured, powerful C compiler and environment system. 2 Disks, counts as 2.
DD77: Fortran - Contains a full featured Fortran77 development system. Also contains EzAsm a strongly macro dependent 68000 assembler.
DD82: Unix - Contains a working demo of Minix - a Unix workalike. Minix is system call compatable with V7 of Unix.
DD83: IBM - Not one, but *TWO* IBM emulators that will allow the running of MS-DOS software *with* Amiga programs!!! Comes complete with programs to turn your Amiga floppy drives into 720K IBM compatable drives.
DD85: AnalytiRIM - Tis incredible program is a combination of a powerful spreadsheet and a Relational Information Manager (database). Not for the faint of heart, this is a heavy-duty package! Req. 1 MB RAM.
DD86: The Programmer - Includes GadTools and REQTools which will allow you to create your user interfaces and then the program will automatically generate "C" source code or Assembly-code--saving you countless hours of work! Requires, and writes code for, AmigaDOS2+.

AmigaDOS 2 Release

Get the most out of your Amiga...update your 500 or 2000 to the latest version of AmigaDOS, System 2.1! Includes ROMs, disks and full documentation. Requires installation.

$99 While supplies last.

WB105A&B: Workbench 2+ Extras #2

This set contains the programs that should have been included with WB2.0. These powerful utilities take full advantage of the *many* new capabilities that are available in Workbench 2.0.
Tool Manager - a wonderful utility to add programs to your TOOL menu, create a collection of icons on the workbench to easily launch frequently used programs...and much more! (See the review in AmigaWorld-May'92)
Virus Protection - just drop this icon in your WBStartup drawer.
Degrader - gives you tools to try to make non-2.0 happy programs work!
Icon - Enhances Workbench's "Show All" to display over 40 distinct icons for different types of files (text, IFF's, source codes, libraries, etc)
Font Editor - Create/edit bitmap fonts with full color support!
Screen Blankers - ala fractals and spliners and swarming bees!
Requester Enhancers - no more stale "Please Insert Volume" requesters--these are *animated* requesters for *all* of the system's requesters.
CPUBlit - speeds up text displays for owners of 68020+ CPU's.
TWO DISK SET, COUNTS AS TWO

THE AMIGAWORLD "BEST-OF" SET!

FD85ABCD: AmigaWorld's Best - These four disks contain the *hottest* p/d games of '92! Includes Mother Lode, Moria, Minefield, Poing, Intruder Alert, Deluxe PacMan, Rocky and Super Artillery (see Dec. '92 AmigaWorld) Four disk set, counts as three.

VIDEO-RELATED DISKS

VO9: 24-Bit - Contains Rend24 which allows you to proof Toaster-generated 24-bit animations. Also contains utils to convert IFF's to IBM VGA/Windows readable format. Also contains latest release of JPEG->IFF converter.
V01: Graphics - Picbase will let you view and track ALL of your IFF pictures over all of those floppies! Freepaint is a Deluxe-Paint workalike. Agraph is a powerful utility to produce snazzy graphs.
V03: Image Utils - let VideoToolsOnTap let you tap into the video power of your Amiga for fades, color and greybars as well as a plethora of other indespensable video functions. TitleGen will do professional crawling titles. JPEG converts JPEG-> IFF with amazing compression. ImageLab performs special effects on IFFs.
VO5: Modelling - Vertex allows you to create 3-D objects without using the abstract X, Y and Z views. Loads Sculpt-3D/4D, Turbo Silver, Imagine, LightWave, GEO and Wavefront formats. MagicTween will metamorphasize any two pictures by automatically animate the "in-between" frames.
VO6: Modelling Objects - Contains 20 vector objects in Imagine format. These are perfect for use with VO5 or your favorite 3D modelling program. Includes Amiga 3000, space station & many more!
VO8: CompuGraphic Fonts - Contains 2 clipart-style fonts and 4 actual typefaces for use with WB2.04 and it's Fountain utility. Great for desktop publishing and/or video projects.

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Activision Studios
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Advanced Storage Systems
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800/878-0010

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1405 N. Ellsworth Ave.
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American Software Distributors
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800/TK-AMIGA

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310/542-2226

Central Coast Software
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England
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916/344-4825

Digital Micronics (DMI)
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619/931-8554

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Europress Software
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Macclesfield SK10 4NP
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0625-859333

Gold Disk
5155 Spectrum Way, Unit 5
Mississauga, Ont.
Canada L4W 5A1
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800/GOLD DSK

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215/337-8770

Gremlin Graphics Software
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Charleston, SC 29413
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Brooklyn Park, MN 55444
612/425-0557

INOVAtronics
8499 Greenville Ave.
Suite 209B
Dallas, TX 75231
214/340-4991

Interplay Productions
17922 Fitch Ave.
Irvine, CA 92714
714/553-6655

Ixion Inc.
1335 N. Northlake Way
Seattle, WA 98103
206/282-6809

Jaeger Software
7800 White Cliff Terrace
Rockville, MD 20855
301/948-6862

Konami
900 Deerfield Pkwy.
Buffalo Grove, IL 60089
708/215-5100

Merit Software
13635 Gamma Rd.
Dallas, TX 75244
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407/384-9484

Mr. Software
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401/846-7639

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Suite 109
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Topeka, KS 66603
913/354-1146
800/843-8934

Ocean Software
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Octree Software
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512/328-5490

Oxxi
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Long Beach, CA 90809
213/427-1227

Programs Plus & Video
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Chatham, Ont.
Canada N7M 2J6
519/436-0988

Progressive Peripherals & Software
464 Kalamath St.
Denver, CO 80204
303/825-4144

Psygnosis
29 St. Mary's Court
Brookline, MA 02146
617/731-3553

Quantum Quality Productions
1046 River Ave.
Flemington, NJ 08822
908/788-2799

ReadySoft
30 Wertheim Court, Unit 2
Richmond Hill, Ont.
Canada L4B 1B9
416/731-4175

SAS Institute
SAS Campus Drive
Cary, SC 27513

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12110 Sunset Hills Rd.
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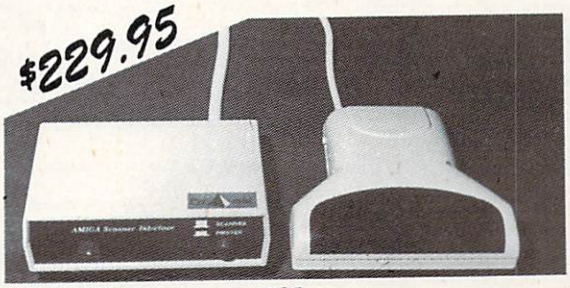
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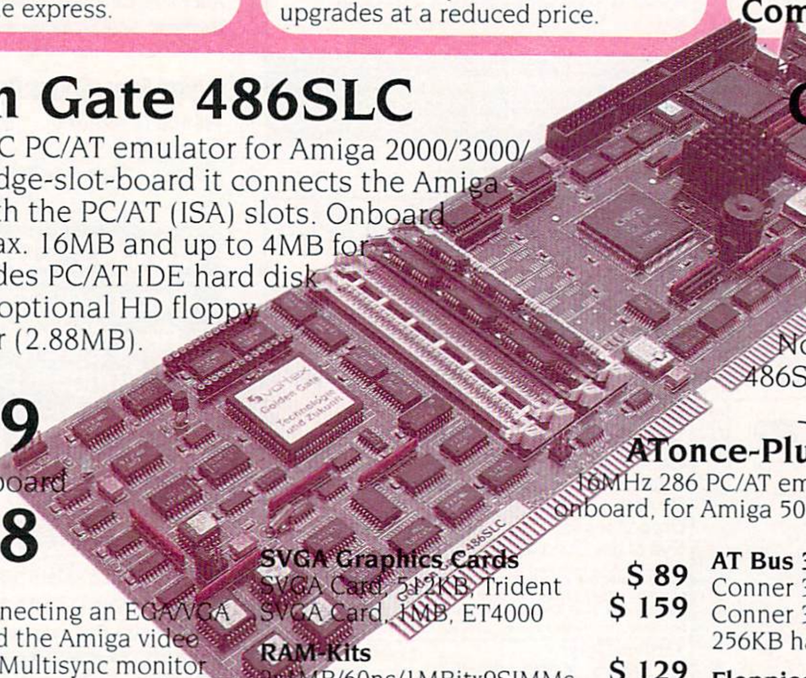
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THE LAST WORD

Kudos, complaints, comments, concerns, and contributions from our readers.

Reader Safety First

As an electrical engineer, I feel compelled to point out a potentially dangerous problem found in the drawing on page 52 of the December '92 *AW*.

Depending on the orientation of the AC plug, exposed metal parts on this device can have a potential 120 volts with respect to ground. Someone touching the device and any grounded object simultaneously (their computer, for instance) could be electrocuted, or at the least receive a very unpleasant electrical shock. Further, since the dimmer switch has a virtual short circuit on its output, it is likely to fail, possibly applying all the current that the AC line can supply to the piece of stainless-steel wire. The result would likely be a shower of molten steel as the wire disintegrates.

The solution to this problem is to place a step-down transformer between the dimmer and the cutting wire. This will isolate the wire and alligator clips from the AC line and control the maximum amount of current, protecting the cutting wire, the dimmer switch and ultimately, the user.

Sorry to have to inform you of this, but I feel it's important for the safety of your readers that you be aware of the potential danger of the device.

David Oliver
Shevlin, Minnesota

Thank you for pointing out the problem. AW readers should follow David's advice, and to anyone reading this who attends a user's group: Please make an announcement about it at your next meeting.

—Eds

The Book on ARexx

The response to the question "Are there any good ARexx books specific to the Amiga?" ("The ARexx Interview," p. 55, Dec. '92) omitted *The ARexx Cookbook*, which is 251 pages of pure tutorial, and includes two full disks of examples: robust, useful, real-world examples. Many of my videographer customers just "plug and go" with ADPro Scale Utility, an example program that solves the knotty pixel aspect versus image aspect problems in video.

The book on ARexx is 100 percent Amiga published. I even used ARexx to program the 600+item multiple index that references Hawes, Commodore, and even the application programs' manuals, both in the back and in the margins of the book. These programs are on Disk II and will work with TurboText by Oxxi and any DTP software.

Merrill Callaway
Author, ***The ARexx Cookbook***

Free Support

In the December issue of *AW*, Merilyn Scott wrote in about her husband's need for a keyboard replacement because he would soon lose the ability to use his keyboard. Black Belt Systems offers several free programs that might help. One, called the "Jake-Board," appears to be exactly what she is searching for; it works with 1.3 and 2.04, and provides an on-screen keyboard that allows complete system use with a mouse, trackball or other Amiga-compatible pointing device. Another, called the TalkBoard, provides a unique and powerful way for speech-impaired people to use the Amiga's speech capabilities to talk in natural, complete sentences with customized vocabularies.

Again, these programs are offered free to anyone who needs them. Call us at 800/852-6442.

Ben Williams
President, Black Belt Systems

AMOS and NTSC

I am writing to make a small correction to the article you printed about the AMOS programming language (p. 22, Dec.'92). The writer of the column stated that the AMOS Compiler and AMOS 3D were available, but had problems with the NTSC standard. I purchased AMOS way back when it was first released and although the original AMOS did have a few utilities that were not "NTSC-friendly," the program still works fine. The compiler, although not officially NTSC, has no problem with NTSC systems at all. Even the intuition screen is fully visible. Though the command extension set works fine, the heart of the 3-D system, the Object Modeler, requires a PAL display. The way around this if you have a Super Agnus in your system, is to use a program like PALCON to switch your screen format. Regardless, AMOS is still the best programming language for the Amiga.

Shane Raistlin Monroe

About This Month's Cover

THE AMIGA-GENERATED butterfly image on our cover is from a four-minute animation entitled "Life" that was created using three Amiga/Video Toaster workstations, and which won the overall Best of Show Award at its debut during Computer Edge's San Diego Computer Fair. All objects in the scene were modeled by Mark Miller of MG Software & Video. The image for print was rendered in Toaster print resolution and transferred to TIFF files using Art Department Professional (ASDG), with the help of Enosis Creative Services, and then saved to a Mac-formatted 880MB Syquest. Photo Visions of San Diego outputted the image through a Master Piece Film Recorder as a 4x5 transparency.

MG Software & Video is a San Diego-based animation company. Its projects range from television commercials to corporate and industrial applications. For further information, contact Victor Gallego at 6660 Reservoir Lane, San Diego, CA 92115; 619/463-0545.